

10A15

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Scientific and Technical Information Center

Requester's Full Name: Michael Cleveland Examiner #: 76884 Date: 7/11/02  
 Art Unit: 1767 Phone Number 308-2331 Serial Number: 09/101534  
 Mail Box and Bldg/Room Location: CP3-10A15 Results Format Preferred (circle):  PAPER  DISK  E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc., if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Method for forming a silicon film and ink composition, for ink jet

Inventors (please provide full names): Shunichi Saki, Tatsuya Shimoda, Satoru Miyashita, Masahiro Furusawa, Ichio Yudasaka, Yasuo Matsuki, Yasumasa Takeuchi

Earliest Priority Filing Date: 3/29/2000

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Primarily, looking for the compound of claim 15:

$Sia X_b Y_c$  ( $X$  is H, F, Cl, Br, or I) ( $Y$  is B or P)

The spec. included examples (compounds 6-27, attached).

The compounds may be called borasilanes, polyborasilanes, silaboranes, or polysilaboranes, or modified silanes. (I've found these terms, but no specific formulas for them.) They call Compound 11 1-borahexapristane and another 1-boracyclopentasilane. I was unable to find either term.

Secondarily, I'm trying to find those compounds as a liquid (such as could be deposited as a coating film, preferably by ink jet).

Thirdly, I'm looking for them as used to produce a boron-doped ( $p$ -type) silicon film or phosphorus-doped ( $n$ -type) silicon film. I'd be interested in seeing if they're used to make glass such as borosilicate, borophosphosilicate (BPSG) or phosphosilicate glass.

## STAFF USE ONLY

Searcher: K. T. Miller

Searcher Phone #: \_\_\_\_\_

Searcher Location: \_\_\_\_\_

Date Searcher Picked Up: 7/8/02Date Completed: 7/8/02Searcher Prep & Review Time: 20

Clerical Prep Time: \_\_\_\_\_

Online Time: 41

## Type of Search

## Vendors and cost where applicable

NA Sequence (#) \_\_\_\_\_ STN \_\_\_\_\_

AA Sequence (#) \_\_\_\_\_ Dialog \_\_\_\_\_

Structure (#) 2 Questel/Orbit \_\_\_\_\_

Bibliographic \_\_\_\_\_ Dr. Link \_\_\_\_\_

Litigation \_\_\_\_\_ Lexis/Nexis \_\_\_\_\_

Fulltext \_\_\_\_\_ Sequence Systems \_\_\_\_\_

Patent Family \_\_\_\_\_ WWW/Internet \_\_\_\_\_

Other \_\_\_\_\_ Other (specify) \_\_\_\_\_

CLEVELAND 09/701534 Page 1

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FILE LAST UPDATED: 5 Jul 2002 (20020705/ED)

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=> D QUE  
L3 48753 SEA FILE=REGISTRY ABB=ON (SI(L)(H OR F OR CL OR BR OR I)(L)(B  
OR P))/ELS  
L4 8214 SEA FILE=REGISTRY ABB=ON L3 AND 3-60/SI  
L5 402 SEA FILE=REGISTRY ABB=ON L4 NOT 1-300/C  
L6 149 SEA FILE=REGISTRY ABB=ON L5 NOT (1-10/O OR 1-10/N)  
L11 101 SEA FILE=REGISTRY ABB=ON L6 NOT 11-40/O  
L12 74 SEA FILE=HCAPLUS ABB=ON L11

desired  
compound

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|     |                            |   |
|-----|----------------------------|---|
| L13 | 2 SEA FILE=HCAPLUS ABB=ON  | L12 AND (INKJET? OR INK(W) JET)                         |
| L14 | 5 SEA FILE=HCAPLUS ABB=ON  | L11(L) FILM#  |
| L15 | 3 SEA FILE=HCAPLUS ABB=ON  | L11 AND COATING?/SC, SX, AB, BI                         |
| L16 | 2 SEA FILE=HCAPLUS ABB=ON  | L11 AND INK#  |
| L17 | 7 SEA FILE=HCAPLUS ABB=ON  | (L13 OR L14 OR L15 OR L16)                              |
| L18 | 1 SEA FILE=HCAPLUS ABB=ON  | L12 AND GLASS?  |
| L21 | 21 SEA FILE=HCAPLUS ABB=ON | L12(L) (PREP OR IMF OR SPN OR TEM OR<br>PROC OR PEP)/RL |
| L22 | 23 SEA FILE=HCAPLUS ABB=ON | L17 OR L18 OR L21                                       |
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| L24 | 23 SEA FILE=HCAPLUS ABB=ON | L22 OR L23  |

=> D L24 ALL 1-23 HITSTR

L24 ANSWER 1 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
 AN 2001:795497 HCAPLUS  
 DN 136:85935  
 TI Theoretical Studies on A3H3+ (A = C, Si, Ge) as .pi. Ligands in Organometallic Chemistry  
 AU Srinivas, Gantasala N.; Yu, Liwen; Schwartz, M.  
 CS Department of Chemistry, University of North Texas, Denton, TX, 76203, USA  
 SO Organometallics (2001), 20(24), 5200-5204  
 CODEN: ORGND7; ISSN: 0276-7333  
 PB American Chemical Society  
 DT Journal  
 LA English  
 CC 29-13 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 22  
 AB .eta.3 .pi. Complexes of A3H3+ (A = C, Si, Ge) with the organometallic fragments Co(CO)3, Rh(CO)3, Ir(CO)3, Ni(CO)3, Co(PH3)3, and Ni(PH3)3 have been studied at the B3LYP and B3P86 levels using the 6-31G(d) basis on ligands and SBKJC-21G relativistic effective core potential and their assocd. basis sets on metals. All the .pi. complexes are min. In Si and Ge complexes there is a ligand to metal charge transfer, making Si3H3 and Ge3H3 cationic ligands, whereas in C complexes there is a small charge transfer from metal to ligand, making C3H3 ligands anionic. These remarkable differences in electronic structure between carbon and its heavier analogs are explained using MOs and natural charges. All the .pi. complexes for Si and Ge are considered viable targets for synthetic pursuit.  
 ST silyl germyl cyclopropyl pi complex cobalt carbonyl phosphine B3LYP; nickel carbonyl phosphine silyl germyl cyclopropyl pi complex B3LYP; iridium carbonyl silyl germyl cyclopropyl pi complex B3LYP; rhodium carbonyl silyl germyl cyclopropyl pi complex B3LYP; electronic structure transition metal silyl germyl cyclopropyl pi complex; effective core potential silyl germyl cyclopropyl pi complex  
 IT Density functional theory  
 (B3LYP; theor. studies on silyl germyl cyclopropyl as pi ligands in organometallic chem.)  
 IT Potential energy  
 (effective, effective-core; theor. studies on silyl germyl cyclopropyl as pi ligands in organometallic chem.)  
 IT Molecular structure  
 (optimized; theor. studies on silyl germyl cyclopropyl as pi ligands in organometallic chem.)  
 IT Charge transfer interaction  
 Electron density  
 Electronic structure  
 Total energy

## Transition state structure

(theor. studies on silyl germyl cyclopropyl as pi ligands in organometallic chem.)

IT 86330-73-6 148920-75-6 385838-25-5 385838-26-6 385838-27-7  
 385838-28-8 385838-29-9 385838-30-2 385838-31-3 385838-32-4  
 385838-33-5 385838-35-7 385838-36-8 385838-37-9 **385838-38-0**  
 385838-39-1 **385838-41-5** 385838-42-6

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)

(theor. studies on silyl germyl cyclopropyl as pi ligands in organometallic chem.)

RE.CNT 64 THERE ARE 64 CITED REFERENCES AVAILABLE FOR THIS RECORD

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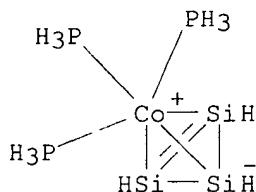
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IT 385838-38-0 385838-41-5

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
 (theor. studies on silyl germyl cyclopropyl as pi ligands in organometallic chem.)

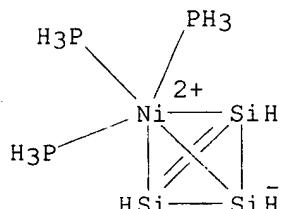
RN 385838-38-0 HCPLUS

CN Cobalt, (.eta.3-2-cyclotrisilene-1-yl)tris(phosphine)- (9CI) (CA INDEX NAME)



RN 385838-41-5 HCPLUS

CN Nickel(1+), (.eta.3-2-cyclotrisilene-1-yl)tris(phosphine)- (9CI) (CA INDEX NAME)



L24 ANSWER 2 OF 23 HCPLUS COPYRIGHT 2002 ACS

AN 2001:745795 HCPLUS

DN 135:296943

TI Formation of patterned silicon films from organic silicon compound liquids

IN Furusawa, Masahiro; Ishida, Katachika

PA Seiko Epson Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 11 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01L021-208

ICS C01B033-02; G03F007-075; H01L029-786; H01L021-336

CC 76-2 (Electric Phenomena)

FAN.CNT 1

PATENT NO. KIND DATE APPLICATION NO. DATE

PI JP 2001284274 A2 20011012 JP 2000-98154 20000331

AB The process involves (i) forming patterns of lyophilic parts and lyophobic parts by using org. films on substrate surfaces, (ii) applying org. Si compd.-contg. liqs. on the lyophilic parts selectively, and (iii) converting the films of the liqs. to Si films by thermal and/or light treatment. The org. films may be self-assembled films. The lyophobic parts may be fluoroalkyl group-contg. self-assembled films. The org. Si compds. may be silanes contg. cyclics shown as  $\text{Si}_n\text{X}_m$  ( $X = \text{H}$  and/or halogen;  $n \geq 0$ ;  $m = n, 2n - 2, 2n, 2n + 2$ ) or modified silanes shown as  $\text{Si}_a\text{X}_b\text{Y}_c$  ( $X = \text{H}$  and/or halogen;  $Y = \text{B}, \text{P}$ ;  $a \geq 0$ ;  $b \geq 0$ ;  $c \geq 0$ ;  $a + b + c \geq 1$ ). The application in (ii) may be run by using ink-jet app. Fine Si film patterns with high precision can be thus obtained by this simple method.

ST silane liq application patterning silicon film; **ink jet**  
silane application patterning silicon; fluoroalkyl silicon self assembled film patterning; cycloalkyl silane liq application patterning

IT **Ink-jet** printing  
Semiconductor films

(formation of patterned Si films from org. Si compd. liqs. by **ink-jet**)

IT 289-22-5, Cyclopentasilane 101753-14-4 299207-51-5,  
Pentasilaboracyclohexane 301205-91-4

RL: **PEP (Physical, engineering or chemical process)**; **TEM (Technical or engineered material use)**; **PROC (Process)**;  
**USES (Uses)**

(formation of patterned Si films from org. Si compd. liqs. by **ink-jet**)

IT 7440-21-3P, Silicon, uses

RL: **IMF (Industrial manufacture)**; **TEM (Technical or engineered material use)**; **PREP (Preparation)**; **USES (Uses)**

(polycryst.; formation of patterned Si films from org. Si compd. liqs. by **ink-jet**)

IT 51851-37-7

RL: **PEP (Physical, engineering or chemical process)**; **TEM (Technical or engineered material use)**; **PROC (Process)**; **USES (Uses)**  
(self-assembled films, patterned; formation of patterned Si films from org. Si compd. liqs. by **ink-jet** on)

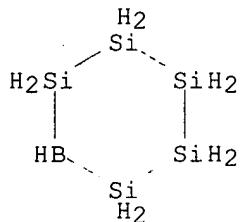
IT 299207-51-5, Pentasilaboracyclohexane 301205-91-4

RL: **PEP (Physical, engineering or chemical process)**; **TEM (Technical or engineered material use)**; **PROC (Process)**;  
**USES (Uses)**

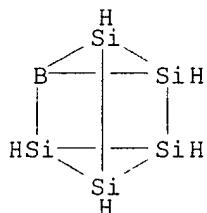
(formation of patterned Si films from org. Si compd. liqs. by **ink-jet**)

RN 299207-51-5 HCAPLUS

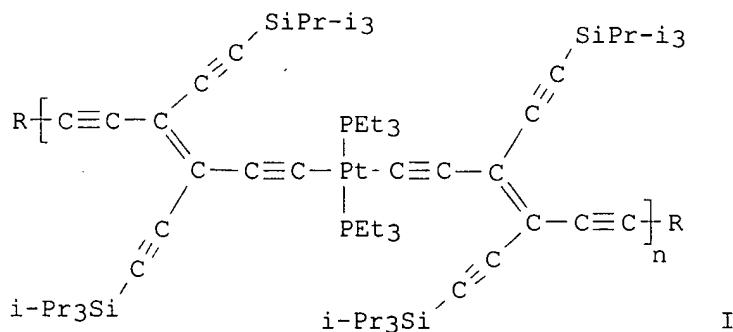
CN Pentasilaboracyclohexane (9CI) (CA INDEX NAME)



RN 301205-91-4 HCAPLUS  
 CN Pentasilaboratetracyclo[2.2.0.02,6.03,5]hexane (9CI) (CA INDEX NAME)



L24 ANSWER 3 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
 AN 2001:240433 HCAPLUS  
 DN 135:19763  
 TI Pt-tetraethynylethene molecular scaffolding: synthesis and characterization of a novel class of organometallic molecular rods  
 AU Siemsen, Peter; Gubler, Ulrich; Bosshard, Christian; Gunter, Peter; Diederich, Francois  
 CS Laboratorium fur Organische Chemie, ETH-Zentrum, Zurich, 8092, Switz.  
 SO Chemistry--A European Journal (2001), 7(6), 1333-1341  
 CODEN: CEUJED; ISSN: 0947-6539  
 PB Wiley-VCH Verlag GmbH  
 DT Journal  
 LA English  
 CC 29-13 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 22, 35, 73  
 GI



AB The series of monodisperse Pt-bridged TEE oligomers I (R = C.tplbond.CPh;

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*n* = 1-6) was prep'd. by oxidative Glaser - Hay oligomerization of monomer 7 under endcapping conditions. These novel mol. rods extend in length from 3.3 nm to 12.1 nm. Their isolation was achieved by high performance gel permeation chromatog. (GPC), and their purifn. was best monitored by anal. GPC in combination with matrix-assisted laser-desorption-ionization mass spectrometry (MALDI-TOF MS). The mass spectra of each oligomer revealed the mol. ion or its sodium complex as parent ion together with a clean, highly characteristic fragmentation pattern. Delayed addn. of the end-capping reagent PhCCH to the oligomerization mixt. afforded polymer I (*R* = H; *n* = 1) with an av. of .apprxeq.32 repeat units and a remarkably narrow mol. wt. distribution (*Mw/Mn* = 1.06), which is indicative of a living polymn. process. UV/Vis spectral data as well as measurements of the second hyperpolarizability  $\gamma$  by third harmonic generation (THG) revealed a nearly complete lack of  $\pi$ -electron delocalization along the oligomeric backbone. The Pt atoms act as true insulating centers, and the Pt-C(sp) bonds hardly possess any  $\pi$  character. The synthesis of the mol. rods I provides another demonstration of the power of oxidative acetylenic homocouplings for the prepn. of unusual nanoarchitecture.

ST platinum tetraethynylethene oligomer prepn mol wire NLO; oxidative Glaser Hay oligomerization platinum tetraethynylethene complex

IT Polymers, preparation  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (conjugated; prepn. and nonlinear optical properties of)

IT Conjugation (bond)  
 (in platinum tetraethynylethene monomers and oligomers)

IT High-performance gel-permeation chromatography  
 Nonlinear optical properties  
 Optical hyperpolarizability  
 Third-harmonic generation  
 (of platinum tetraethynylethene oligomers)

IT Coupling reaction  
 Polymerization  
 (oxidative Glaser-Hay polymn.; of platinum tetraethynylethene monomers)

IT Laser ionization mass spectrometry  
 (photodesorption, matrix-assisted; of platinum tetraethynylethene oligomers)

IT Laser desorption mass spectrometry  
 (photoionization, matrix-assisted; of platinum tetraethynylethene oligomers)

IT Oligomers  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. and nonlinear optical properties of)

IT 155063-39-1  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (Hagihara coupling of)

IT 13965-02-1  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (Hagihara coupling of trans tetraethynylethene)

IT 177500-66-2  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (Hagihara coupling of, to form corresponding platinum bis(acetylidyne) complex)

IT 536-74-3, Phenylacetylene  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (NO NUM 3,4; coupling reaction with platinum tetraethynylethene monomers)

IT 342885-85-2P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (failed reaction; prepn. and attempted oligomerization of)

IT 342885-88-5P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and desilylation of)

IT 342885-89-6DP, terminated by phenylacetylene 342885-90-9P 342885-91-0P  
 342885-92-1P 343338-77-2P 343339-09-3P 343339-70-8P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. and nonlinear optical properties of)

IT 342885-86-3P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and oxidative Glaser-Hay oligomerization of)

RE.CNT 76 THERE ARE 76 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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1987, V1, P23 HCAPLUS

IT 343339-09-3P 343339-70-8P

RL: PRP (Properties); SPN (Synthetic preparation); PREP  
(Preparation)

(prepn. and nonlinear optical properties of)

RN 343339-09-3 HCAPLUS

CN Platinum, bis[(3Z)-8-phenyl-3,4-bis[[tris(1-methylethyl)silyl]ethynyl]-3-octene-1,5,7-triynyl]tetrakis[.mu.-(3Z,9Z)-3,4,9,10-tetrakis[[tris(1-methylethyl)silyl]ethynyl]-3,9-dodecadiene-1,5,7,11-tetrayne-1,12-diyl]dodecakis(triethylphosphine)penta-, stereoisomer (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 343339-70-8 HCAPLUS

CN Platinum, bis[(3Z)-8-phenyl-3,4-bis[[tris(1-methylethyl)silyl]ethynyl]-3-octene-1,5,7-triynyl]pentakis[.mu.-(3Z,9Z)-3,4,9,10-tetrakis[[tris(1-methylethyl)silyl]ethynyl]-3,9-dodecadiene-1,5,7,11-tetraene-1,12-diyl]dodecakis(triethylphosphine)hexa-, stereoisomer (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L24 ANSWER 4 OF 23 HCAPLUS COPYRIGHT 2002 ACS

AN 2000:752418 HCAPLUS

DN 134:80121

TI New Metallocendrimers Containing an Octakis(diphenylphosphino)-Functionalized Silsesquioxane Core and Ruthenium(II)-Based Chromophores

AU Murfee, Hunter J.; Thoms, Travis P. S.; Greaves, John; Hong, Bo

CS Department of Chemistry, University of California, Irvine, CA, 92697-2025,  
USA

SO Inorganic Chemistry (2000), 39(23), 5209-5217  
CODEN: INOCAJ; ISSN: 0020-1669

PB American Chemical Society

DT Journal

LA English

CC 78-7 (Inorganic Chemicals and Reactions)  
Section cross-reference(s): 72, 73

AB A new class of surface-modified dendrimers was prep'd. by reactions of 8 equiv of the terpyridine-functionalized polyether monodendrons with a polyhedral oligomeric silsesquioxane (POSS) core. Subsequent reactions of these spherically shaped org. dendrimers with Ru(II)-based precursors afford photo- and redox-active metallodendrimers. These new dendrimers were characterized using a combination of mass spectral anal. (MALDI-TOF/MS, ESI/MS, and FAB/MS), NMR (1H, 13C, 29Si, and 31P{1H} NMR); photophys. analyses (electronic absorption, emission, excited-state lifetime, and quantum yield) and electrochem. measurement (cyclic voltammetry). Specifically, 31P{1H} NMR was used to monitor the completion of reactions and the purity of dendrimers and metallodendrimers. These new metallodendrimers exhibit large extinction coeffs. that coincide with the no. of peripheral Ru(II)-based chromophores. With the use of (-CH2-C6H4-tpy)RuII(bpy)2 type of chromophores, all metallodendrimers are found emissive at room temp., with lifetimes at 605-890 ns. Photophys. data also indicate similar steady-state emission maxima and single-exponential decay kinetics for all metallodendrimers, and the obsd. overall quantum yields of the G1, G2, and G3 metallodendrimers are 14, 20, and 7 times higher than that of the monomeric model complex (CH3-C6H4-tpy)Ru(bpy)2(PF6)2. Electrochem. studies reveal surface-confined species, in addn. to the ligand-centered and metal-centered redox processes.

ST metallodendrimer silsesquioxane core ruthenium terpyridine phosphonioalkyl functionalized polyether prepn; photophys metallodendrimer silsesquioxane core ruthenium terpyridine phosphonioalkyl functionalized polyether; electrochem redox metallodendrimer silsesquioxane core ruthenium terpyridine phosphonioalkyl polyether

IT Polyethers, preparation  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)  
(dendrimers, ruthenium complexes; prepn., photophys. and electrochem. properties of metallodendrimers contg. octakis(diphenylphosphino)-functionalized silsesquioxane core and ruthenium(II)-based chromophores)

IT Redox reaction  
(electrochem.; of metallodendrimers contg. octakis(diphenylphosphino)-functionalized silsesquioxane core and ruthenium(II)-based chromophores)

IT Absorptivity  
(enhanced extinction coeffs. of metallodendrimers contg. octakis(diphenylphosphino)-functionalized silsesquioxane core and ruthenium(II)-based chromophores)

IT Excited state  
(lifetime; photophys. properties of metallodendrimers contg. octakis(diphenylphosphino)-functionalized silsesquioxane core and ruthenium(II)-based chromophores)

IT Luminescence  
Redox potential  
(of metallodendrimers contg. octakis(diphenylphosphino)-functionalized silsesquioxane core and ruthenium(II)-based chromophores)

IT Dendritic polymers

RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)  
(polyethers, ruthenium complexes; prepn., photophys. and electrochem. properties of metallodendrimers contg. octakis(diphenylphosphino)-functionalized silsesquioxane core and ruthenium(II)-based chromophores)

IT Dendritic polymers  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)  
(starburst; prepn., photophys. and electrochem. properties of metallodendrimers contg. octakis(diphenylphosphino)-functionalized silsesquioxane core and ruthenium(II)-based chromophores)

IT 15746-57-3, Bis(2,2'-bipyridine)dichlororuthenium 29654-55-5,  
3,5-Dihydroxybenzyl alcohol 89972-78-1 200200-88-0  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(for prepn. of metallodendrimers contg. octakis(diphenylphosphino)-functionalized silsesquioxane core and ruthenium(II)-based chromophores)

IT 200200-86-8P 200200-87-9P 200200-89-1P 225114-66-9P 314285-73-9P  
315202-23-4P 315202-35-8P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(for prepn. of metallodendrimers contg. octakis(diphenylphosphino)-functionalized silsesquioxane core and ruthenium(II)-based chromophores)

IT 89972-77-0  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(metalation with ruthenium(II) bipyridine complex)

IT 269411-30-5P 315202-54-1P 315202-62-1P 315202-73-4P  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(prepn., photophys. and electrochem. properties of)

RE.CNT 58 THERE ARE 58 CITED REFERENCES AVAILABLE FOR THIS RECORD

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IT 315202-35-8P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(for prepn. of metallocendrimers contg. octakis(diphenylphosphino)-functionalized silsesquioxane core and ruthenium(II)-based chromophores)

RN 315202-35-8 HCPLUS

CN Phosphonium, (pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-octaylocta-2,1-ethanediyl)octakis[[[3,5-bis[[3,5-bis[(4-[2,2':6',2''-terpyridin]-4'-ylphenyl)methoxy]phenyl]methoxy]phenyl]methyl]diphenyl-, octabromide (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 315202-73-4P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(prepn., photophys. and electrochem. properties of)

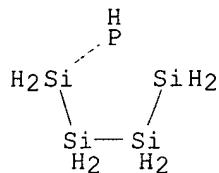
RN 315202-73-4 HCPLUS

CN Ruthenium(72+), tetrahexacontakis(2,2'-bipyridine-.kappa.N1,.kappa.N1')[.mu.32-[(pentacyclo[9.5.1.13,9.15,15.17,13]octasiloxane-1,3,5,7,9,11,13,15-octaylocta-2,1-ethanediyl)octakis[[[3,5-bis[[4-[2,2':6',2''-terpyridin]-4'-yl-.kappa.N1,.kappa.N1']phenyl)methoxy]phenyl]methyl]diphenylphosphonium]]dotriaconta-, octabromide (9CI) (CA INDEX NAME)

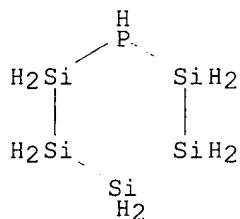
\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

AN 2000:707413 HCPLUS  
DN 133:284155  
TI Manufacture of solar cell containing semiconductor thin layers  
IN Furusawa, Masahiro; Seki, Shunichi; Miyashita, Satoru; Shimoda, Tatsuya;  
Yudasaka, Ichio; Matsuki, Yasuo; Takeuchi, Yasumasa  
PA Seiko Epson Corporation, Japan; JSR Corporation  
SO PCT Int. Appl., 35 pp.  
CODEN: PIXXD2  
DT Patent  
LA Japanese  
IC ICM H01L031-042  
ICS H01L021-208  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
FAN.CNT 1  
PATENT NO. KIND DATE APPLICATION NO. DATE  
-----  
PI WO 2000059044 A1 20001005 WO 2000-JP1989 20000329  
W: CN, JP, KR, US  
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,  
PT, SE  
EP 1085579 A1 20010321 EP 2000-912947 20000329  
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
IE, FI  
TW 447143 B 20010721 TW 2000-89105750 20000329  
PRAI JP 1999-90313 A 19990330  
WO 2000-JP1989 W 20000329  
AB A solar cell has a structure comprising a pair of electrodes between which  
are interposed at least two thin layers of semiconductor contg. different  
types and/or concns. of impurity. A process of producing the thin  
semiconductor layers comprises applying a silicide-contg. liq. compn. to a  
substrate to form a **coating**, and converting the **coating**  
to a silicon layer by heat treatment and/or photochem. processing.  
ST solar cell semiconductor thin layer manuf  
IT Semiconductor films  
Solar cells  
(manuf. of solar cell contg. semiconductor thin layers)  
IT 291-59-8, Cyclohexasilane **14700-24-4**,  
Phosphatetrasilacyclopentane 15493-30-8 33729-86-1,  
~~Dicyclopentylsilane 68457-50-1~~, Phosphapentasilacyclohexane  
101753-14-4 112160-57-3 300350-57-6  
RL: RCT (Reactant); TEM (Technical or engineered material use);  
RACT (Reactant or reagent); USES (Uses)  
(in manuf. of solar cell contg. semiconductor thin layers)  
RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE  
(1) Anon; JP 02-500397 A  
(2) Anon; GB 2215129 A  
(3) Anon; EP 325606 A  
(4) Anon; DE 3790981 A  
(5) Anon; KR 9601468 B  
(6) Canon Inc; JP 06-132552 A 1994  
(7) Mobil Solar Energy Corporation; WO 8900341 A 1989  
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(9) Sharp Corporation; JP 2000-31066 A 2000  
(10) Showa Denko KK; JP 07-267621 A 1995 HCPLUS  
(11) Toshiba Corporation; JP 09-237927 A 1997 HCPLUS  
IT **14700-24-4**, Phosphatetrasilacyclopentane **68457-50-1**,  
Phosphapentasilacyclohexane 300350-57-6  
RL: RCT (Reactant); TEM (Technical or engineered material use);  
RACT (Reactant or reagent); USES (Uses)

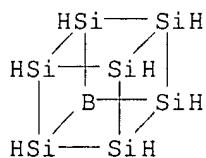
(in manuf. of solar cell contg. semiconductor thin layers)  
 RN 14700-24-4 HCPLUS  
 CN Phosphatetrasilacyclopentane (8CI, 9CI) (CA INDEX NAME)



RN 68457-50-1 HCPLUS  
 CN (Phosphapentasilacyclohexane (9CI) (CA INDEX NAME)



RN 300350-57-6 HCPLUS  
 CN Heptasilaborapentacyclo[4.2.0.02,5.03,8.04,7]octane (9CI) (CA INDEX NAME)



L24 ANSWER 6 OF 23 HCPLUS COPYRIGHT 2002 ACS  
 AN 2000:707397 HCPLUS  
 DN 133:289885  
 TI Method for forming silicon film  
 IN Shimoda, Tatsuya; Miyashita, Satoru; Seki, Shunichi; Furusawa, Masahiro;  
 Yudasaka, Ichio; Takeuchi, Yasumasa; Matsuki, Yasuo  
 PA Seiko Epson Corporation, Japan; JSR Corporation  
 SO PCT Int. Appl., 25 pp.  
 CODEN: PIXXD2

*applicants*

DT Patent  
 LA Japanese

IC ICM H01L021-208  
 ICS C01B033-02

CC 76-3 (Electric Phenomena)  
 Section cross-reference(s): 75

FAN.CNT 1

|    | PATENT NO.        | KIND | DATE     | APPLICATION NO. | DATE     |
|----|-------------------|------|----------|-----------------|----------|
| PI | WO 2000059015     | A1   | 20001005 | WO 2000-JP1988  | 20000329 |
|    | W: CN, JP, KR, US |      |          |                 |          |

RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

EP 1085560 A1 20010321 EP 2000-912946 20000329

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI

PRAI JP 1999-90312 A 19990330  
WO 2000-JP1988 W 20000329

AB A method for forming a Si film which comprises applying a soln. contg. a cyclic silane compd. free of C and/or a silane compd. modified with B or P on a substrate to form a film of a Si precursor, and then subjecting the film to a treatment by heat and/or light to convert the Si precursor to a semiconductive Si. The method can be used for providing a Si film having good properties as an electronic material with a low cost and with ease and simplicity, since it does not comprise a vacuum process which is involved in the CVD method and the like.

ST silicon semiconductor film **coating**

IT **Coating process**

Semiconductor films

Semiconductor materials

(method for forming silicon film by **coating**)

IT 7440-21-3, Silicon, processes

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(method for forming silicon film by **coating**)

IT 4493-26-9, Hexaprismane **14700-24-4**, Phosphatetrasilacyclopentane

101753-14-4 168294-11-9, 1,1'-Bicyclopentasilane 299207-49-1,  
1,1'-Bicyclohexasilane 299207-50-4 299207-51-5,  
Pentasilaboracyclohexane 299207-52-6

RL: TEM (Technical or engineered material use); USES (Uses)  
(method for forming silicon film by **coating**)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

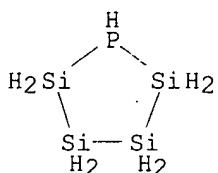
- (1) Sharp Corporation; JP 08-8179 A 1996 HCPLUS
- (2) Sharp Corporation; JP 10-321536 A 1998 HCPLUS
- (3) Sharp Corporation; JP 2000-12465 A 2000
- (4) Sharp Corporation; JP 2000-31066 A 2000
- (5) Sharp Corporation; JP 2000-7317 A 2000
- (6) Showa Denko KK; JP 05-144741 A 1993
- (7) Showa Denko KK; JP 06-191821 A 1994 HCPLUS

IT **14700-24-4**, Phosphatetrasilacyclopentane 299207-50-4  
299207-51-5, Pentasilaboracyclohexane 299207-52-6

RL: TEM (Technical or engineered material use); USES (Uses)  
(method for forming silicon film by **coating**)

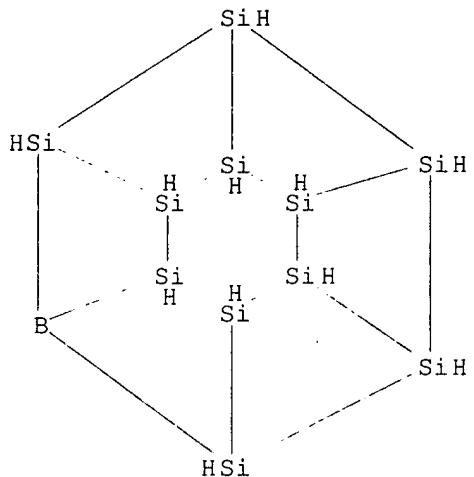
RN 14700-24-4 HCPLUS

CN Phosphatetrasilacyclopentane (8CI, 9CI) (CA INDEX NAME)



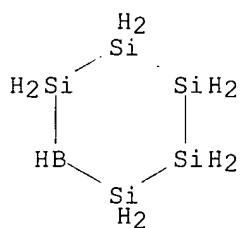
RN 299207-50-4 HCPLUS

CN Undecasilaboraheptacyclo[6.4.0.02,7.03,6.04,11.05,10.09,12]dodecane (9CI)  
(CA INDEX NAME)



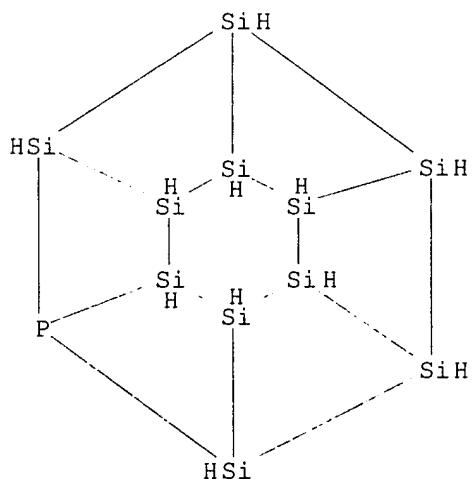
RN 299207-51-5 HCAPLUS

CN Pentasilaboracyclohexane (9CI) (CA INDEX NAME)



RN 299207-52-6 HCAPLUS

CN Phosphashaundecasilahexacyclo[6.4.0.02,7.03,6.04,11.05,10.09,12]dodecane (9CI) (CA INDEX NAME)



L24 ANSWER 7 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
AN 2000:707396 HCAPLUS

KATHLEEN FULLER EIC 1700/LAW LIBRARY 308-4290

DN 133:303586  
 TI Method for forming silicon film and **ink** composition for  
**ink jet**  
 IN Seki, Shunichi; Shimoda, Tatsuya; Miyashita, Satoru; Furusawa, Masahiro;  
 Yudasaka, Ichio; Matsuki, Yasuo; Takeuchi, Yasumasa  
 PA Seiko Epson Corporation, Japan; JSR Corporation  
 SO PCT Int. Appl., 36 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA Japanese  
 IC ICM H01L021-208  
 ICS C01B033-02  
 CC 74-6 (Radiation Chemistry, Photochemistry, and Photographic and Other  
 Reprographic Processes)  
 Section cross-reference(s): 75

*application*

FAN.CNT 1

|      | PATENT NO.  | KIND | DATE     | APPLICATION NO.  | DATE     |
|------|---|------|----------|------------------|----------|
| PI   | WO 2000059014   | A1   | 20001005 | WO 2000-JP1987   | 20000329 |
|      | W: CN, JP, KR, US   |      |          |                  |          |
|      | RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,<br>PT, SE |      |          |                  |          |
|      | EP 1087428  | A1   | 20010328 | EP 2000-912945   | 20000329 |
|      | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,<br>IE, FI  |      |          |                  |          |
|      | TW 457554   | B    | 20011001 | TW 2000-89105850 | 20000329 |
| PRAI | JP 1999-90311   | A    | 19990330 |                  |          |
|      | WO 2000-JP1987  | W    | 20000329 |                  |          |

AB A method for forming a Si film which comprises discharging an **ink** compn. selectively onto a predetd. region of a substrate using an **ink jet** head to form a pattern of a Si precursor, and then subjecting the pattern to a treatment by heat and/or light to convert the Si precursor to an amorphous Si film or a polycryst. Si film. The method can be used for providing a Si film pattern on a large area portion of a substrate with saving energy with a low cost.

ST silicon film **ink jet** printing

IT **Ink-jet** printing  
 (method for forming a silicon film and **ink** compn. for  
**ink jet**)

IT **Inks**  
 (printing; method for forming a silicon film and **ink** compn.  
 for **ink jet**)

IT 7440-21-3, Silicon, processes  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (method for forming a silicon film and **ink** compn. for  
**ink jet**)

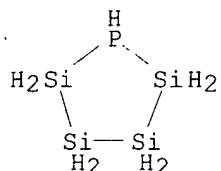
IT 289-22-5, Cyclopentasilane 14700-24-4,  
 Phosphatetrasilacyclopentane 42430-26-2,  
 Tetrasilaboracyclopentane 112160-57-3, Octasilacubane 301205-89-0  
 301205-91-4  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (method for forming a silicon film and **ink** compn.  
 for **ink jet**)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD

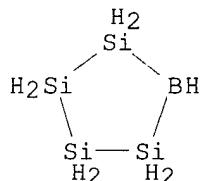
RE

- (1) Hitachi Ltd; JP 03-215941 A 1991
- (2) Sharp Corporation; JP 08-8179 A 1996 HCPLUS
- (3) Sharp Corporation; JP 10-321536 A 1998 HCPLUS
- (4) Sharp Corporation; JP 11-79727 A 1999 HCPLUS
- (5) Showa Denko KK; JP 05-144741 A 1993

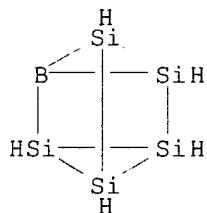
(6) Showa Denko KK; JP 06-191821 A 1994 HCAPLUS  
IT 14700-24-4, Phosphatetrasilacyclopentane 42430-26-2,  
Tetrasilaboracyclopentane 301205-91-4  
RL: TEM (Technical or engineered material use); USES (Uses)  
(method for forming a silicon film and ink compn.  
for ink jet)  
RN 14700-24-4 HCAPLUS  
CN Phosphatetrasilacyclopentane (8CI, 9CI) (CA INDEX NAME)



RN 42430-26-2 HCAPLUS  
CN Tetrasilaboracyclopentane (9CI) (CA INDEX NAME)



RN 301205-91-4 HCAPLUS  
CN Pentasilaboratetracyclo[2.2.0.02,6.03,5]hexane (9CI) (CA INDEX NAME)



L24 ANSWER 8 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
AN 1999:702682 HCAPLUS  
DN 132:72756  
TI Soluble Iron/Gold Cluster Containing Carbosilane Dendrimers  
AU Benito, Monica; Rossell, Oriol; Seco, Miquel; Segales, Gloria  
CS Departament de Quimica Inorganica, Universitat de Barcelona, Barcelona,  
E-08028, Spain  
SO Organometallics (1999), 18(24), 5191-5193  
CODEN: ORGND7; ISSN: 0276-7333  
PB American Chemical Society  
DT Journal  
LA English  
CC 78-7 (Inorganic Chemicals and Reactions)  
Section cross-reference(s): 29

AB The synthesis of sol. carbosilane dendrimers terminated with AuFe2 and AuFe3 carbonyl cluster units is reported. For example, Si(CH2CH2SiMe(CH2PPh2AuCl)2)4 reacts with [Fe2(CO)6(.mu.-CO)(.mu.-PPh2)]- and [Fe3(CO)11]2- to give the mixed-metal cluster dendrimers Si(CH2CH2SiMe(CH2PPh2AuFe2(CO)6)(.mu.-CO)(.mu.-PPh2)2)4 and Si(CH2CH2SiMe(CH2PPh2AuFe3(CO)11)(.mu.-PPh2)2)4, resp.

ST carbosilane dendrimer terminated iron gold cluster prepn  
IT Silanes

IT RL: SPN (Synthetic preparation); PREP (Preparation)  
(carbosilanes, dendritic; prepn. of sol. iron/gold cluster contg.  
carbosilane dendrimers)

IT Cluster compounds

IT RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of sol. iron/gold cluster contg. carbosilane dendrimers)

IT 95765-17-6 191937-45-8 246536-82-3 253150-65-1 253150-67-3

IT RL: RCT (Reactant); RACT (Reactant or reagent)  
(for prepn. of sol. iron/gold cluster contg. carbosilane dendrimers)

IT 253169-28-7P 253170-29-5P 253170-33-1P 253171-15-2P

IT RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of)

RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Balohg, L; J Am Chem Soc 1998, V120, P7355
- (2) Benito, M; Inorg Chim Acta 1999, V291, P247 HCPLUS
- (3) Constable, E; Chem Commun 1998, P2661 HCPLUS
- (4) Ferrer, M; J Chem Soc Dalton Trans 1991, P347 HCPLUS
- (5) Gorman, C; J Am Chem Soc 1997, V119, P1141 HCPLUS
- (6) Hodali, H; Inorg Synth 1980, V20, P222
- (7) Holmes-Smith, R; J Chem Soc Perkin Trans 1983, V1, P861
- (8) Larre, C; Chem Eur J 1998, V4, P2031 HCPLUS
- (9) Reina, R; J Organomet Chem 1990, V398, P285 HCPLUS
- (10) Rossell, O; Organometallics 1994, V13, P2127 HCPLUS
- (11) Rossell, O; Organometallics 1997, V16, P236 HCPLUS
- (12) Seyferth, D; Organometallics 1994, V13, P2682 HCPLUS
- (13) Seyferth, D; Organometallics 1995, V14, P5362 HCPLUS
- (14) Slany, M; Inorg Chem 1997, V36, P1939 HCPLUS
- (15) Uson, R; Organomet Synth 1986, V3, P324
- (16) van der Made, A; Chem Commun 1992, P1400 HCPLUS
- (17) Wang, R; J Am Chem Soc 1999, V121, P3549 HCPLUS
- (18) Zhao, M; J Am Chem Soc 1998, V120, P4877 HCPLUS
- (19) Zhou, L; Macromolecules 1993, V26, P963 HCPLUS

IT 253170-33-1P

IT RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of)

RN 253170-33-1 HCPLUS

CN Iron, [ .mu.8-[6,18-bis[2-[[(diphenylphosphino-.kappa.P)methyl]dimethylsilyl]ethyl]-12,12-bis[6-[2-[[(diphenylphosphino-.kappa.P)methyl]dimethylsilyl]ethyl]-3,3,6,9,9-pentamethyl-11,11-diphenyl-11-phospha-3,6,9-trisilaundec-1-yl]-3,3,6,9,9,15,15,18,21,21-decamethyl-1,1,23,23-tetraphenyl-1,23-diphospha-3,6,9,12,15,18,21-heptasilatricosane-.kappa.P:.kappa.P']]octagold]octa-.mu.-carbonyloctatetracontacarbonyloctak is[.mu.-(diphenylphosphino)]hexadeca-, cluster (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

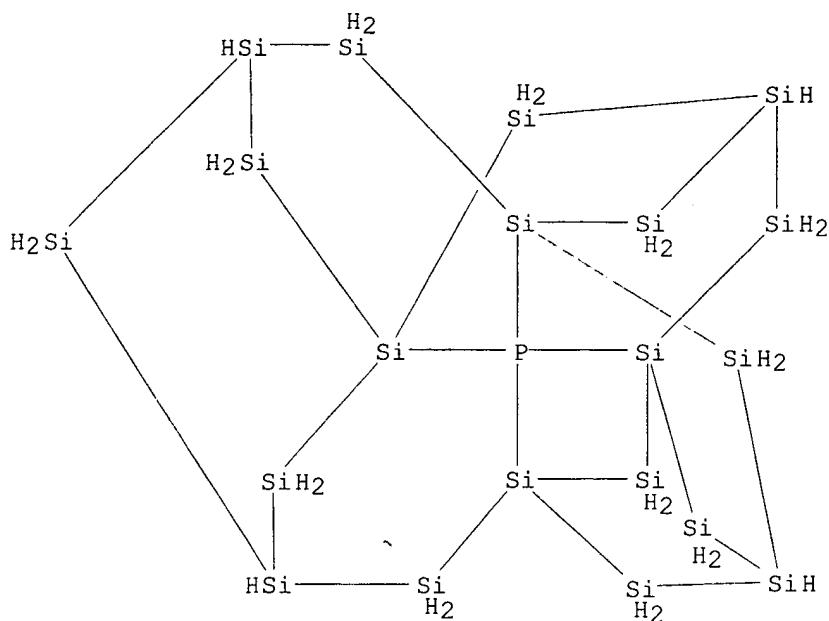
L24 ANSWER 9 OF 23 HCPLUS COPYRIGHT 2002 ACS

AN 1992:658491 HCPLUS

DN 117:258491

TI Amorphous clusters. I. Electronic structure of silicon clusters with nitrogen, phosphorus and arsenic dopants

AU Sansores, L. E.; Valladares, R. M.; Cogordan, J. A.; Valladares, A. A.  
CS Inst. Invest. Mater., UNAM, Mexico City, 04510, Mex.  
SO *J. Non-Cryst. Solids* (1992), 143(2-3), 232-40  
CODEN: JNCSBJ; ISSN: 0022-3093  
DT Journal  
LA English  
CC 65-3 (General Physical Chemistry)  
AB Amorphous impurity clusters of the type  $\text{Si}_20\text{H}_{28}$  with X = N, P and As have been studied using the well-known pseudopotential SCF Hartree-Fock method (and the HONDO Program). The local electronic d. of states and charge d. contours have been obtained. The covalent nature of the bonding in undoped silicon is altered by the presence of the dopants and both an ionic component and a shielding effect appear when N, P and As are substituted in the center of the amorphous cluster. Also, the local d. of states in the neighborhood of a Si atom, nearest neighbor to the center of the cluster, indicates the presence of a new p-state in the band gap. There are quant. differences in the electronic structure of the clusters as a function of the dopants. These results are analyzed in the light of the local changes and their relevance to the amorphous solid state properties.  
ST silicon hydride cluster density state doping; nitrogen doped silicon cluster density state; phosphorus doped silicon cluster density state; arsenic doped silicon cluster density state; bonding doped silicon cluster density state; charge density silicon hydride cluster doping  
IT Electron configuration and Electron density  
(of silicon hydride clusters, effect of doping with nitrogen and phosphorus and arsenic on)  
IT Clusters  
(silicon hydride, electronic structure of, effect of doping with nitrogen and phosphorus and arsenic on)  
IT Energy level, band structure  
(d. of states, of silicon hydride clusters, effect of doping with nitrogen and phosphorus and arsenic on)  
IT Bond  
(silicon-silicon, in silicon hydride clusters, effect of doping with nitrogen and phosphorus and arsenic on)  
IT 115519-96-5P 115519-97-6P 115519-98-7P 145779-47-1P  
RL: PREP (Preparation)  
(prepn. of)  
IT 115519-98-7P  
RL: PREP (Preparation)  
(prepn. of)  
RN 115519-98-7 HCAPLUS  
CN 2.lambda.5-Phospha-1,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21-eicosasilaoctacyclo[7.7.1.11,11.13,7.13,15.15,13.02,7.02,13]heneicos-2-yl (9CI) (CA INDEX NAME)



L24 ANSWER 10 OF 23 HCPLUS COPYRIGHT 2002 ACS  
 AN 1991:632759 HCPLUS  
 DN 115:232759  
 TI Solid-phase synthesis of RNA via a silyl-protecting-group strategy  
 AU Dreef-Tromp, C. M.; Van Dam, E. M. A.; Van den Elst, H.; Van den Boogaart, J. E.; Van der Marel, G. A.; Van Boom, J. H.  
 CS Gorlaeus Lab., Leiden, 2300 RA, Neth.  
 SO Recl. Trav. Chim. Pays-Bas (1991), 110(9), 378-83  
 CODEN: RTCPA3; ISSN: 0165-0513  
 DT Journal  
 LA English  
 CC 33-10 (Carbohydrates)  
 AB Ribonucleoside phosphoramidites, were prepd. in which the exocyclic amino functions and 2'-hydroxyl functions are protected with 2-[(tert-butyldiphenylsiloxy)methyl]benzoyl (SiOMB) groups and tert-butyldimethylsilyl (TBDMS) groups, resp. The N-SiOMB/O-TBDMS-blocked nucleosides proved to be suitable building units in a solid-phase synthesis of the RNA-fragment 5'-AGAGUACCU-3' via a phosphite triester approach.  
 ST RNA fragment solid phase synthesis; nucleoside phosphoramidite building unit RNA; butyldiphenylsiloxyethylbenzoyl protective group nucleoside; butyldimethylsilyl protective group nucleoside; silyl protecting strategy RNA fragment synthesis  
 IT Protective groups  
     (butyldiphenylsiloxyethylbenzoyl, for nucleosides in synthesis of RNA fragment)  
 IT Nucleosides, preparation  
     RL: SPN (Synthetic preparation); PREP (Preparation)  
     (phosphoramidites, prepn. of, in synthesis of RNA fragment)  
 IT Protective groups  
     (butyldimethylsilyl, for nucleosides in synthesis of RNA fragment)  
 IT 129452-86-4  
     RL: RCT (Reactant)  
     (acylation by, of nucleosides)

IT 89992-70-1  
RL: RCT (Reactant)  
(phosphitylation by, of nucleosides)

IT 137094-75-8DP, solid supported  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and ammonolysis of)

IT 137094-74-7P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and deblocking of)

IT 137094-76-9DP, solid supported  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and detritylation of)

IT 137116-55-3P 137116-56-4P 137116-57-5P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and partial silylation of)

IT 137116-58-6P 137116-59-7P 137140-40-0P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and phosphitylation of)

IT 137116-52-0P 137116-53-1P 137116-54-2P 137116-63-3P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of)

IT 137116-60-0P 137116-61-1P 137140-41-1P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, in synthesis of RNA fragment)

IT 137116-62-2D, polymer supported  
RL: RCT (Reactant)  
(reactions of, in synthesis of RNA fragment)

IT 58-61-7, Adenosine, reactions 65-46-3, Cytidine 118-00-3, Guanosine, reactions  
RL: RCT (Reactant)  
(sequential silylation and partial tritylation of)

IT 137094-75-8DP, solid supported  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and ammonolysis of)

RN 137094-75-8 HCAPLUS

CN Adenosine, 2'-O-(3-carboxy-1-oxopropyl)-P-(2-cyanoethyl)-3'-O-[(1,1-dimethylethyl)dimethylsilyl]uridylyl-(5'.fwdarw.3')-P-(2-cyanoethyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[(1,1-dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]cytidylyl-(5'.fwdarw.3')-P-(2-cyanoethyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[(1,1-dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]cytidylyl-(5'.fwdarw.3')-P-(2-cyanoethyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[(1,1-dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]adenylyl-(5'.fwdarw.3')-P-(2-cyanoethyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]uridylyl-(5'.fwdarw.3')-P-(2-cyanoethyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[(1,1-dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]guanylyl-(5'.fwdarw.3')-P-(2-cyanoethyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[(1,1-dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]adenylyl-(5'.fwdarw.3')-P-(2-cyanoethyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[(1,1-dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]guanylyl-(5'.fwdarw.3')-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[(1,1-dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]- (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 137094-74-7P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP

### (Preparation)

(prep. and deblocking of)

RN 137094-74-7 HCAPLUS  
 CN Adenosine, 3'-O-[(1,1-dimethylethyl)dimethylsilyl]uridylyl-(5'.fwdarw.3')-  
 2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[(1,1-  
 dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]cytidylyl-(5'.fwdarw.3')-2'-  
 O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[(1,1-  
 dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]cytidylyl-(5'.fwdarw.3')-2'-  
 O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[(1,1-  
 dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]adenylyl-(5'.fwdarw.3')-2'-  
 O-[(1,1-dimethylethyl)dimethylsilyl]uridylyl-(5'.fwdarw.3')-2'-O-[(1,1-  
 dimethylethyl)dimethylsilyl]-N-[2-[(1,1-dimethylethyl)diphenylsilyl]oxy]  
 methyl]benzoyl]guanylyl-(5'.fwdarw.3')-2'-O-[(1,1-  
 dimethylethyl)dimethylsilyl]-N-[2-[(1,1-dimethylethyl)diphenylsilyl]oxy]  
 methyl]benzoyl]adenylyl-(5'.fwdarw.3')-2'-O-[(1,1-  
 dimethylethyl)dimethylsilyl]-N-[2-[(1,1-dimethylethyl)diphenylsilyl]oxy]  
 methyl]benzoyl]guanylyl-(5'.fwdarw.3')-2'-O-[(1,1-  
 dimethylethyl)dimethylsilyl]-N-[2-[(1,1-dimethylethyl)diphenylsilyl]oxy]  
 methyl]benzoyl]- (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

IT 137094-76-9DP, solid supported

RL: RCT (Reactant); SPN (Synthetic preparation); PREP

reparation)

RN (prepn. and detritylation of)  
137094-76-9 HCAPLUS  
CN Adenosine, 2'-O-(3-carboxy-1-oxopropyl)-P-(2-cyanoethyl)-3'-O-[(1,1-dimethylethyl)dimethylsilyl]uridylyl-(5'.fwdarw.3')-P-(2-cyanoethyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[[[(1,1-dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]cytidylyl-(5'.fwdarw.3')-P-(2-cyanoethyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[[[(1,1-dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]cytidylyl-(5'.fwdarw.3')-P-(2-cyanoethyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[[[(1,1-dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]adenylyl-(5'.fwdarw.3')-P-(2-cyanoethyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]uridylyl-(5'.fwdarw.3')-P-(2-cyanoethyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[[[(1,1-dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]guanylyl-(5'.fwdarw.3')-P-(2-cyanoethyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[[[(1,1-dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]adenylyl-(5'.fwdarw.3')-P-(2-cyanoethyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[[[(1,1-dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]guanylyl-(5'.fwdarw.3')-5'-O-[bis(4-methoxyphenyl)phenylmethyl]-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-[2-[[[(1,1-dimethylethyl)diphenylsilyl]oxy]methyl]benzoyl]- (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L24 ANSWER 11 OF 23 HCPLUS COPYRIGHT 2002 ACS

ANSWER II OF 20 NOV  
AN 1990:612130 HCAPLUS

DN 113:212130

TI Concerning the synthesis of the heptaphosphanortricyclanes R3P7 R = Et, iso-Pr, n-Bu, iso-Bu, SiH2Me, SiH3, Et2PSiMe2

AU Fritz, G.; Schneider, H. W.

CS Inst. Anorg. Chem., Univ. Karlsruhe, Karlsruhe, D-7500, Fed. Rep. G

SO Z. Anorg. Allg. Chem. (1990), 584, 12-20

CODEN: ZAACAB; ISSN: 0044-2313

DT Journal

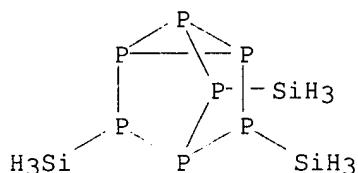
DI German  
LA German

CC 29-7 (Organometallic and Organometalloidal Compounds)

OS CASREACT 113:212130

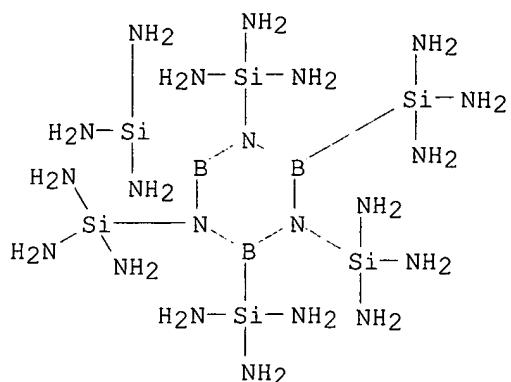
AB The preparative access to the compds. Et<sub>3</sub>P<sub>7</sub> (1), i-Pr<sub>3</sub>P<sub>7</sub> (2), n-Bu<sub>3</sub>P<sub>7</sub> (3), i-Bu<sub>3</sub>P<sub>7</sub> (4), (H<sub>3</sub>Si)<sub>3</sub>P<sub>7</sub> (5), (MeH<sub>2</sub>Si)<sub>3</sub>P<sub>7</sub> (6), and (Et<sub>2</sub>P-SiMe<sub>2</sub>)<sub>3</sub>P<sub>7</sub> (7) through the reaction of Li<sub>3</sub>P<sub>7</sub>.cntdot.3DME with either EtBr, i-PrBr, n-BuBr, H<sub>3</sub>SiI, MeSiH<sub>2</sub>Br or Et<sub>2</sub>PSiMe<sub>2</sub>Cl, resp., is described. At 20.degree. the compds. 1 to 4 are yellow-greenish, viscous liqs. (viscosity increases with the size of R), which are sol. in ethers and non-polar solvents. 5 Forms colorless crystals, which (similar to those of 6) decomp., when exposed to sunlight. 6 And 7 are generated quant., these compds., however, cannot be isolated undecomposed. While the formation of 1 occurs quant. via the red intermediate Li<sub>2</sub>EtP<sub>7</sub>, it is possible to isolate Li(i-Pr)<sub>2</sub>P<sub>7</sub> from the residue of the reaction leading to i-Pr<sub>3</sub>P<sub>7</sub>. This Li-phosphide is said to cause the formation of higher, P-rich phosphines like i-Pr<sub>3</sub>P<sub>9</sub>. Treatment of Li<sub>3</sub>P<sub>7</sub> with (Me<sub>3</sub>C)<sub>3</sub>SiBr does not yield [(Me<sub>3</sub>C)<sub>3</sub>Si]<sub>3</sub>P<sub>7</sub>. The ratio R<sub>3</sub>P<sub>7</sub>(sym.):R<sub>3</sub>P<sub>7</sub>(asym.) is 1:3 for Et<sub>3</sub>P<sub>7</sub> or Me<sub>3</sub>P<sub>7</sub> and shifts with increasing size of R, favoring the sym. isomer. There are no hints for the formation of an asym. isomer in (H<sub>2</sub>Si)<sub>3</sub>P<sub>7</sub> - as already known from (Me<sub>3</sub>Si)<sub>3</sub>P<sub>7</sub>, where an asym. isomer does not exist either.

ST heptaphosphanortricyclane alkyl substituted  
 IT Alkyl halides  
 RL: RCT (Reactant)  
     (alkylation by, of heptaphosphanortricyclane)  
 IT Silylation  
     (of heptaphosphanortricyclane)  
 IT Condensation reaction  
     (of heptaphosphanortricyclane with alkyl halides)  
 IT 74-96-4, Ethyl bromide 75-26-3 78-77-3, Isobutyl bromide 109-65-9,  
 Butyl bromide  
 RL: RCT (Reactant)  
     (alkylation by, of heptaphosphanortricyclane)  
 IT 87224-84-8  
 RL: RCT (Reactant)  
     (alkylation of, with alkyl hydrides)  
 IT 130282-00-7  
 RL: RCT (Reactant)  
     (intermediate formation and alkylation of)  
 IT 18140-24-4P 87219-71-4P 87248-69-9P 130281-96-8P 130281-97-9P  
 130281-98-0P 130281-99-1P 130325-04-1P 130325-05-2P 130331-72-5P  
 130404-20-5P 130468-03-0P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
     (prepn. of)  
 IT 1631-88-5 13598-42-0 56348-25-5  
 RL: RCT (Reactant)  
     (silylation by, of heptaphosphanortricyclane)  
 IT 130404-20-5P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
     (prepn. of)  
 RN 130404-20-5 HCPLUS  
 CN Heptaphosphatricyclo[2.2.1.02,6]heptane, trisilyl-, stereoisomer (9CI)  
     (CA INDEX NAME)



L24 ANSWER 12 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
 AN 1990:416375 HCAPLUS  
 DN 113:16375  
 TI Process for manufacturing silicon boron nitride layers for integrated  
 semiconductor circuits  
 IN Treichel, Helmuth; Spindler, Oswald; Neureither, Bernhard  
 PA Siemens A.-G., Fed. Rep. Ger.  
 SO Eur. Pat. Appl., 6 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA German  
 IC ICM H01L021-318  
 ICS C23C016-34; C23C016-44  
 CC 76-10 (Electric Phenomena)  
 Section cross-reference(s): 75  
 FAN.CNT 1

|      | PATENT NO.   | KIND | DATE     | APPLICATION NO: | DATE     |
|------|--|------|----------|-----------------|----------|
| PI   | EP 355366  | A2   | 19900228 | EP 1989-112677  | 19890711 |
|      | EP 355366  | A3   | 19910313 |                 |          |
|      | R: AT, CH, DE, FR, GB, IT, LI, NL  |      |          |                 |          |
|      | US 4990365   | A    | 19910205 | US 1989-367358  | 19890616 |
|      | JP 02102531  | A2   | 19900416 | JP 1989-207765  | 19890810 |
| PRAI | DE 1988-3827949  |      | 19880817 |                 |          |
| OS   | MARPAT 113:16375   |      |          |                 |          |
| AB   | Methods for forming Si B nitride layers having dielec. consts. of <4<br>$\epsilon$ by plasma-enhanced chem. vapor deposition entail the use of a<br>fluid low-mol.-wt. compd. which either contains B, N, and Si and is<br>admitted into the deposition chamber along with a carrier gas or contains<br>B and N and is introduced into the chamber along with $\text{SiH}_4$ and $\text{Si}_2\text{H}_6$ . The layers are useful as intermetalization insulators or<br>passivation layers for integrated circuits. |      |          |                 |          |
| ST   | silicon boron nitride chem vapor deposition; interlayer insulator silicon<br>boron nitride film; passivation layer silicon boron nitride film;<br>deposition source material silicon boron nitride   |      |          |                 |          |
| IT   | Electric insulators and Dielectrics<br>(boron silicon nitride films, for integrated circuits, precursors for<br>formation of)  |      |          |                 |          |
| IT   | Electric circuits<br>(integrated, boron silicon nitride film deposition for, precursors for)   |      |          |                 |          |
| IT   | 37293-19-9, Boron silicon nitride<br>RL: USES (Uses)<br>(deposition of films of, boron- and nitrogen- and silicon-contg.<br>precursors for)  |      |          |                 |          |
| IT   | 1590-87-0, Disilane 6569-51-3, Borazine 7664-41-7, Ammonia, uses and<br>miscellaneous 7727-37-9, Nitrogen, uses and miscellaneous 7803-62-5,<br>Silane, uses and miscellaneous 127443-84-9 127544-94-9<br>127544-95-0 127544-96-1<br>RL: USES (Uses)<br>(in silicon boron nitride film formation)  |      |          |                 |          |
| IT   | <b>127443-84-9</b><br>RL: USES (Uses)<br>(in silicon boron nitride film formation)   |      |          |                 |          |
| RN   | 127443-84-9 HCAPLUS  |      |          |                 |          |
| CN   | Silanetriamine, 1,1',1'',1''',1''''',1'''''-1,2,3,4,5,6-<br>borazinehexylhexakis- (9CI) (CA INDEX NAME)  |      |          |                 |          |



L24 ANSWER 13 OF 23 HCAPLUS COPYRIGHT 2002 ACS

AN 1989:32944 HCAPLUS

DN 110:32944

TI Redistribution of primary silyl- and germylphosphines: synthesis of trisilyl- and trigermethylphosphines

AU Wingeleth, Dale E.; Norman, Arlan D.

CS Dep. Chem. Biochem., Univ. Colorado, Boulder, CO, 80309, USA

SO Phosphorus Sulfur (1988), 39(1-2), 123-9

CODEN: PRSEDF; ISSN: 0308-664X

DT Journal

LA English

CC 78-8 (Inorganic Chemicals and Reactions)

AB Redistribution reactions of SiH<sub>3</sub>PH<sub>2</sub>, Si<sub>2</sub>H<sub>5</sub>PH<sub>2</sub>, SiH<sub>3</sub>PH<sub>2</sub>/Si<sub>2</sub>H<sub>5</sub>PH<sub>2</sub>, and GeH<sub>3</sub>PH<sub>2</sub> promoted by BX<sub>3</sub> (X = F, Cl, Br), B<sub>2</sub>H<sub>6</sub>, and B<sub>5</sub>H<sub>9</sub> as routes to the trisilyl- and trigermethylphosphines (SiH<sub>3</sub>)<sub>3</sub>P, (Si<sub>2</sub>H<sub>5</sub>)<sub>3</sub>P, (SiH<sub>3</sub>)<sub>2</sub>PSi<sub>2</sub>H<sub>5</sub>, and (GeH<sub>3</sub>)<sub>3</sub>P were examd. Reaction of the silyl- or germylphosphine borane complex (e.g. SiH<sub>3</sub>PH<sub>2</sub>.BF<sub>3</sub>) with the uncomplexed silyl- or germylphosphine (e.g., SiH<sub>3</sub>PH<sub>2</sub>) appears essential to the redistribution process. Trisilylphosphines and (GeH<sub>3</sub>)<sub>3</sub>P are best obtained in RPH<sub>2</sub>(R = SiH<sub>3</sub>, Si<sub>2</sub>H<sub>5</sub>)-BF<sub>3</sub> and GeH<sub>3</sub>PH<sub>2</sub>-B<sub>5</sub>H<sub>9</sub> reaction systems, resp.

ST phosphine trisilyl trigermyl prepn; silylphosphine redistribution borane promotion; germylphosphine redistribution borane promotion; redistribution germylphosphine silylphosphine borane promotion

IT Redistribution reaction

(of germyl- and silylphosphines promoted by boranes)

IT 118122-18-2P 118150-63-3P

RL: FORM (Formation, nonpreparative); PREP (Preparation)

(formation of, in (disilaethyl)phosphine redistribution promoted by boron trifluoride)

IT 7803-51-2P, Phosphine

RL: FORM (Formation, nonpreparative); PREP (Preparation)

(formation of, in germyl- and silylphosphine redistribution reactions promoted by boranes)

IT 13537-30-9P, Germyl fluoride

RL: FORM (Formation, nonpreparative); PREP (Preparation)

(formation of, in germylphosphine redistribution promoted by boron trifluoride)

IT 118145-05-4P

RL: FORM (Formation, nonpreparative); PREP (Preparation)

(formation of, in germylphosphine redistribution promoted by diborane)

IT 41593-56-0P

RL: FORM (Formation, nonpreparative); PREP (Preparation)

(formation of, in germylphosphine redistribution reaction promoted by boron trifluoride)

IT 14616-42-3P, Bis(silyl)phosphine  
 RL: FORM (Formation, nonpreparative); PREP (Preparation)  
 (formation of, in redistribution reaction of silylphosphine promoted by boranes)

IT 13465-78-6P, Chlorosilane  
 RL: FORM (Formation, nonpreparative); PREP (Preparation)  
 (formation of, in silylphosphine redistribution reaction promoted by boron trichloride)

IT 33296-83-2P  
 RL: FORM (Formation, nonpreparative); PREP (Preparation)  
 (formation of, in silylphosphine redistribution reactions in presence of boranes)

IT 22466-33-7P, Tris(disilaethyl)phosphine  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. by (disilaethyl)phosphine redistribution promoted by borane trifluoride and phosphorus-31 NMR of)

IT 15587-38-9P, Trigermylphosphine  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of, by germylphosphine redistribution promoted by boranes)

IT 15110-33-5P, Tris(silyl)phosphine  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of, by silylphosphine redistribution reaction promoted by boranes)

IT 7637-07-2, Boron trifluoride, reactions 10294-34-5, Boron trichloride  
 19287-45-7, Diborane(6) 19624-22-7, Pentaborane(9)  
 RL: RCT (Reactant)  
 (promotion by, of germyl- and silylphosphine redistribution)

IT 10294-33-4, Boron tribromide  
 RL: RCT (Reactant)  
 (promotion by, of silylphosphine redistribution, attempted)

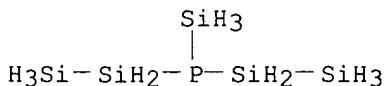
IT 13573-06-3, Germyl phosphine 14616-43-4 14616-47-8, Silyl phosphine  
 RL: RCT (Reactant)  
 (reactions of, with boranes, redistribution in)

IT 118122-18-2P 118150-63-3P  
 RL: FORM (Formation, nonpreparative); PREP (Preparation)  
 (formation of, in (disilaethyl)phosphine redistribution promoted by boron trifluoride)

RN 118122-18-2 HCAPLUS  
 CN Phosphine, bis(disilanyl)- (9CI) (CA INDEX NAME)



RN 118150-63-3 HCAPLUS  
 CN Phosphine, bis(disilanyl)silyl- (9CI) (CA INDEX NAME)

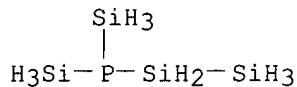


IT 33296-83-2P  
 RL: FORM (Formation, nonpreparative); PREP (Preparation)  
 (formation of, in silylphosphine redistribution reactions in presence of boranes)

RN 33296-83-2 HCAPLUS

CLEVELAND 09/701534 Page 28

CN Phosphine, disilanyldisilyl- (8CI, 9CI) (CA INDEX NAME)



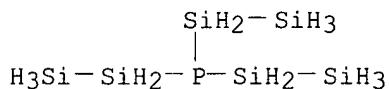
IT 22466-33-7P, Tris(disilaethyl)phosphine

RL: **SPN (Synthetic preparation); PREP (Preparation)**

(prepn. by (disilaethyl)phosphine redistribution promoted by borane trifluoride and phosphorus-31 NMR of)

RN 22466-33-7 HCAPLUS

CN Phosphine, tris(disilanyl)- (8CI, 9CI) (CA INDEX NAME)



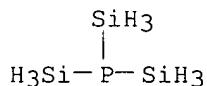
IT 15110-33-5P, Tris(silyl)phosphine

RL: **SPN (Synthetic preparation); PREP (Preparation)**

(prepn. of, by silylphosphine redistribution reaction promoted by boranes)

RN 15110-33-5 HCAPLUS

CN Phosphine, trisilyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



L24 ANSWER 14 OF 23 HCAPLUS COPYRIGHT 2002 ACS

AN 1988:14312 HCAPLUS

DN 108:14312

TI Activation by dehydrogenation or dehalogenation of deposition feedstock and dopant materials useful in the fabrication of hydrogenated amorphous silicon alloys for photovoltaic devices and other semiconductor devices

IN Dickson, Charles R.; Carlson, David E.

PA Solarex Corp., USA

SO U.S., 27 pp.

CODEN: USXXAM

DT Patent

LA English

IC ICM B05D003-06

NCL 427038000

CC 75-2 (Crystallography and Liquid Crystals)  
Section cross-reference(s): 52, 76

FAN.CNT 2

|      | PATENT NO.     | KIND | DATE     | APPLICATION NO. | DATE     |
|------|----------------|------|----------|-----------------|----------|
| CPI  | US 4690830     | A    | 19870901 | US 1986-830072  | 19860218 |
|      | IN 169759      | A    | 19911221 | IN 1989-CA712   | 19890831 |
| PRAI | US 1986-830072 |      | 19860218 |                 |          |
|      | IN 1987-CA123  |      | 19870213 |                 |          |

AB Processes for prep. hydrogenated amorphous Si alloy films (e.g., for fabricating of semiconductor devices such as photovoltaic devices) are

described which entail introducing a gas mixt. into a deposition chamber and activating the mixt. by dehydrogenation or dehalogenation. The activation may be accomplished as part of a photochem. vapor deposition process (optionally Hg-sensitized), by reaction with at. H, by dehydrogenation with F2 or at. F, by catalytic processes, or by introduction of energetic electrons into the gas mixt. The gas mixt. may include compds. having the general formulas: (MX3)<sub>n</sub>M'X<sub>4-n</sub>, where M and M' are different Group IVA atoms, 1 of M and M' is Si, X is H, a halogen, or a mixt. of those, and n (an integer) = 1-4; atom selected from P, As, Sb, and Bi, X is as above, and m (an integer) = 1-3; and YJX<sub>2</sub>, where Y is a halogen or a carbonyl, J is a Group IIIA atom and X is as above. The gas mixt. may also include SiH<sub>4</sub>.

ST silicon alloy film deposition feedstock activation; dehydrogenation film deposition feedstock activation; dehalogenation film deposition feedstock activation; solar cell film deposition feedstock activation; semiconductor device film deposition feedstock activation

IT Photoelectric devices, solar  
Semiconductor devices  
(activation of feedstock gases for film deposition for)

IT Films  
(deposition of, of hydrogenated amorphous silicon alloys, feedstock gas activation for)

IT Dehalogenation  
Dehydrogenation  
(in activation of feedstock gases for film deposition)

IT Silicon alloy, base  
RL: PRP (Properties)  
(deposition of hydrogenated amorphous films of, activation of feedstock gases for)

IT 1333-74-0  
RL: PRP (Properties)  
(dehydrogenation, in activation of feedstock gases for film deposition)

IT 11148-21-3  
RL: PRP (Properties)  
(deposition of hydrogenated amorphous films of, activation of feedstock gases for)

IT 7803-62-5, Silane, uses and miscellaneous  
RL: USES (Uses)  
(film deposition feedstock gas mixt. contg., activation of)

IT 1759-88-2, Disilylmethane 4142-85-2 7446-70-0, Aluminum chloride, uses and miscellaneous 7637-07-2, Boron trifluoride, uses and miscellaneous 13205-44-2, Borane carbonyl 13450-90-3 13709-83-6 13768-63-3  
**15110-33-5**, Trisilylphosphine 15110-34-6 19287-45-7, Diborane 32832-35-2 56962-86-8 56962-87-9 56962-88-0  
RL: PRP (Properties)  
(film deposition feedstock gas mixt. contg., activation of)

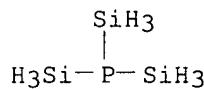
IT 111914-03-5  
RL: RCT (Reactant)  
(hydrogenation of, silicon and germanium hydrides as film deposition feed stock material from)

IT 7782-65-2, Germanium hydride (GeH<sub>4</sub>)  
RL: PRP (Properties)  
(silylgermane feedstock gases from, for film deposition)

IT **15110-33-5**, Trisilylphosphine  
RL: PRP (Properties)  
(film deposition feedstock gas mixt. contg., activation of)

RN 15110-33-5 HCAPLUS

CN Phosphine, trisilyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



L24 ANSWER 15 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
 AN 1987:558384 HCAPLUS  
 DN 107:158384  
 TI Deposition feedstock and dopant materials useful in the fabrication of hydrogenated amorphous silicon alloys for photovoltaic devices and other semiconductor devices  
 IN Dickson, Charles Robert  
 PA Solarex Corp., USA  
 SO Eur. Pat. Appl., 33 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 IC ICM H01L031-18  
 ICS H01L031-02; C23C016-24  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 76  
 FAN.CNT 2

|      | PATENT NO.   | KIND | DATE     | APPLICATION NO. | DATE     |
|------|--|------|----------|-----------------|----------|
| PI   | EP 233613  | A2   | 19870826 | EP 1987-102090  | 19870213 |
|      | EP 233613  | A3   | 19901128 |                 |          |
|      | EP 233613  | B1   | 19950405 |                 |          |
|      | R: AT, BE, CH, DE, ES, FR, GB, GR, IT, LI, LU, NL, SE  |      |          |                 |          |
|      | IN 168381  | A    | 19910323 | IN 1987-CA123   | 19870213 |
|      | AT 120884  | E    | 19950415 | AT 1987-102090  | 19870213 |
|      | ES 2074041   | T3   | 19950901 | ES 1987-102090  | 19870213 |
|      | AU 8768839   | A1   | 19870820 | AU 1987-68839   | 19870216 |
|      | AU 604227  | B2   | 19901213 |                 |          |
|      | CA 1332343   | A1   | 19941011 | CA 1987-529799  | 19870216 |
|      | JP 63051680  | A2   | 19880304 | JP 1987-34388   | 19870217 |
|      | CN 87100729  | A    | 19871125 | CN 1987-100729  | 19870218 |
|      | CN 1024929   | B    | 19940608 |                 |          |
|      | IN 169758  | A    | 19911221 | IN 1989-CA711   | 19890831 |
|      | IN 169840  | A    | 19911228 | IN 1989-CA710   | 19890831 |
|      | AU 9063080   | A1   | 19901213 | AU 1990-63080   | 19900924 |
|      | AU 640408  | B2   | 19930826 |                 |          |
|      | AU 9067671   | A1   | 19910314 | AU 1990-67671   | 19901130 |
|      | AU 637852  | B2   | 19930610 |                 |          |
| PRAI | US 1986-830073   |      | 19860218 |                 |          |
|      | IN 1987-CA123  |      | 19870213 |                 |          |
| AB   | (MX3) <sub>n</sub> M <sub>1</sub> X <sub>4-n</sub> , where M and M <sub>1</sub> are different Group IVA atoms, .gtoreq.1 of M and M <sub>1</sub> is Si, X is H and/or halogen, and n is an integer between 1 and 4 inclusive, are useful as deposition feedstock materials in the formation of hydrogenated amorphous Si alloys (a-Si alloys:H) useful in the fabrication of the title devices. (SiX3) <sub>m</sub> LX <sub>3-m</sub> , where L is Group VA atom selected from P, As, Sb, and Bi and m is 1, 2, or 3, are useful in neg. doping the a-Si alloys:H, and QM <sub>2</sub> X <sub>2</sub> , where Q is halogen or carbonyl and M <sub>2</sub> is a Group IIIA atom are useful in the pos. doping of a-Si alloys:H. Preps. of various feedstock and dopant materials of the invention, of various a-Si alloys:H, and of various photovoltaic devices using these alloys and performances of these devices are reported. |      |          |                 |          |
| ST   | hydrogenated amorphous silicon solar cell; silicon alloy hydrogenated amorphous; dopant hydrogenated amorphous silicon alloy   |      |          |                 |          |
| IT   | Photoelectric devices, solar   |      |          |                 |          |

(hydrogenated amorphous silicon alloys for, deposition feedstock and dopant materials for manuf. of)

IT 7637-07-2P, Boron trifluoride, uses and miscellaneous 13205-44-2P, Borane carbonyl 13709-83-6P, Difluoroborane 15110-33-5P, Trisilylphosphine 15110-34-6P, Trisilylarsine  
 RL: PREP (Preparation)  
 (dopants, prep. of, for manuf. of hydrogenated amorphous silicon alloys for solar cells)

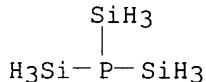
IT 409-21-2P, Silicon carbide, preparation 11148-21-3P  
 RL: PREP (Preparation)  
 (hydrogenated amorphous, manuf. of, for solar cells)

IT 992-94-9P, Monosilylmethane 1759-88-2P, Disilylmethane 13768-63-3P, Monosilylgermane  
 RL: PREP (Preparation)  
 (prep. of, for manuf. of hydrogenated amorphous silicon alloys for solar cells)

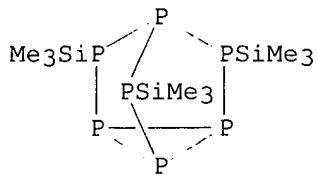
IT 7440-38-2P, Arsenic, uses and miscellaneous 7440-42-8P, Boron, uses and miscellaneous 7723-14-0P, Phosphorus, uses and miscellaneous  
 RL: PREP (Preparation); USES (Uses)  
 (silicon alloys doped with, hydrogenated amorphous, manuf. of, for solar cells)

IT 15110-33-5P, Trisilylphosphine  
 RL: PREP (Preparation)  
 (dopants, prep. of, for manuf. of hydrogenated amorphous silicon alloys for solar cells)

RN 15110-33-5 HCAPLUS  
 CN Phosphine, trisilyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



L24 ANSWER 16 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
 AN 1983:540031 HCAPLUS  
 DN 99:140031  
 TI Substituted heptaphosphanortricyclenes: derivatives and homologs of P<sub>7</sub>(SiMe<sub>3</sub>)<sub>3</sub>  
 AU Fritz, G.; Hoppe, K. D.; Hoenle, W.; Weber, D.; Mujica, C.; Manriquez, V.; Von Schnerring, H. G.  
 CS Inst. Anorg. Chem., Univ. Karlsruhe, Karlsruhe, D-7500, Fed. Rep. Ger.  
 SO J. Organomet. Chem. (1983), 249(1), 63-80  
 CODEN: JORCAI; ISSN: 0022-328X  
 DT Journal  
 LA English  
 CC 29-7 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 75  
 GI



AB Homologs and derivs. of  $P_7(SiMe_3)_3$  (I) were synthesized either from  $Li_3P_7$ .cntdot.3solvent or  $Na_3P_7$ , or by cleavage of the P-SiMe<sub>3</sub> bond with RX. The reaction of  $Li_3P_7$ .cntdot.3DME (DME = dimethoxyethane) with  $Ph_3SiCl$ ,  $H_3SiI$ ,  $Me_3SnBr$ ,  $Me_2CHBr$ , or  $CpFe(CO)_2Br$  yields  $P_7(SiPh_3)_3$ ,  $P_7(SiH_3)_3$ ,  $P_7(SnMe_3)_3$ ,  $P_7(CHMe_2)_3$  and  $P_7[Fe(CO)_2Cp]_3$ .  $Na_3P_7$  reacts with  $Me_3MCl$  ( $M = Si, Ge, Sn$ ) yielding  $P_7(MMe_3)_3$ . The reaction of  $Li_3P_7$ .3DME with  $PM_2Cl$  leads to  $P_2Me_4$ , but  $P_7(PMe_2)_3$  is not formed. Cleavage of the P-Si bond in  $P_7(SiMe_3)_3$  by  $Me_3SnBr$  or  $Me_3SnCl$  gives the compds.  $P_7(SiMe_3)_3-n(SnMe_3)_n$  ( $n = 1, 2, 3$ ) depending on the molar ratio. The reaction with HI yields mixts. of  $H_3-nP_7(SiMe_3)_n$ , while I<sub>2</sub> converts  $P_7(SiMe_3)_3$  into  $P_2I_4$ ,  $PI_3$  and  $Me_3SiI$ . Crystals of the Ge and Sn compds. are less sensitive towards oxidn. and hydrolysis than  $P_7(SiMe_3)_3$ . The compds. were identified by <sup>31</sup>P NMR and mass spectra. An x-ray structure anal. has shown  $P_7(MMe_3)_3$  ( $M = Si, Ge, Sn, Pb$ ) to be isotypical. The compds. crystallize as pure enantiomers. Bond lengths and angles vary with their position in the  $P_7$  cage and are almost unaffected by the substitution. The cone angle of the bridging P atom decreases with increasing size of M. The  $P_7$  cage vibrations are almost unchanged by the substitution, whereas  $\nu(P-M)$  and  $\nu(M-C_3)$  change in the usual manner.

ST heptaphosphanortricyclene silyl; silylheptaphosphanortricyclene; germylheptaphosphanortricyclene; stannylylheptaphosphanortricyclene; plumbylheptaphosphanortricyclene

IT Crystal structure

Molecular structure  
(of trisilyl derivs. of heptaphosphanortricyclene and related compds.)

IT 108-86-1, reactions

RL: RCT (Reactant)  
(attempted reaction of, with heptaphosphanortricyclene trianion)

IT 73553-40-9P 87219-71-4P 87219-72-5P 87219-73-6P  
87219-74-7P 87219-75-8P 87219-76-9P 87224-99-5P 87248-68-8P  
87248-69-9P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of)

IT 87248-65-5P 87248-66-6P 87248-67-7P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn., spectra, and structure of)

IT 87304-23-2P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn., spectra, structure, and reactions of)

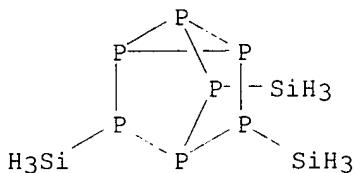
IT 87219-69-0P 87219-70-3P 87248-63-3P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn., structure, and spectra of)

IT 87248-64-4P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn., structure, spectra, and reactions of)

IT 87224-84-8  
RL: RCT (Reactant)  
(reaction of, with halo-contg. compds.)

IT 74-96-4 75-26-3 76-86-8 344-04-7 507-19-7 507-20-0 811-62-1  
1066-44-0 1066-45-1 1529-47-1 12078-20-5 13465-73-1 13598-42-0

IT RL: RCT (Reactant)  
 (reaction of, with heptaphosphanortricyclene trianion)  
 IT 82584-48-3  
 RL: RCT (Reactant)  
 (reactions of, with trimethylgermyl and trimethylstannylyl chlorides)  
 IT 1066-44-0 10034-85-2 59624-91-8  
 RL: RCT (Reactant)  
 (silicon-phosphorus bond cleavage by, in silyl derivs. of  
 heptaphosphanortricyclene)  
 IT 73553-40-9P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)  
 RN 73553-40-9 HCAPLUS  
 CN Heptaphosphatricyclo[2.2.1.02,6]heptane, trisilyl- (9CI) (CA INDEX NAME)



L24 ANSWER 17 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
 AN 1982:200094 HCAPLUS  
 DN 96:200094  
 TI Modified phosphotriester method for chemical synthesis of  
 ribooligonucleotides. Part I. Synthesis of riboundecaadenylate and two  
 fragments constituting the sequence of R-17 translation control signal  
 AU Sung, Wing L.; Narang, Saran A.  
 CS Div. Biol. Sci., Natl. Res. Counc. Canada, Ottawa, ON, K1A 0R6, Can.  
 SO Can. J. Chem. (1982), 60(2), 111-20  
 CODEN: CJCHAG; ISSN: 0008-4042  
 DT Journal  
 LA English  
 CC 33-10 (Carbohydrates)  
 AB A modified phosphotriester method was successfully applied for the chem.  
 synthesis of oligoribonucleotides, r-A7, r-A11, r5'-AAACAUAGATGA-3', and  
 r5'-UUACCCAUGU-3' (R-17, translation control sequence). The starting  
 material was a fully protected monoribonucleoside contg. a  
 3'-phosphotriester group. The coupling reaction was performed using  
 mesitylenesulfonyl tetrazole and purifn. of the product was achieved using  
 reversed phase column chromatog.  
 ST oligoribonucleotide prepn phosphotriester; nucleotide oligoribo prepn  
 phosphotriester; adenylate undecaribo  
 IT Nucleotides, preparation  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (oligoribo-, prepn. of, by phosphotriester method)  
 IT 81412-81-9P 81412-84-2P 81412-85-3P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (prepn. and deprotection of)  
 IT 13089-48-0P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. and dimethoxytritylation of)  
 IT 81246-78-8P 81246-81-3P 81256-88-4P 81256-89-5P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. and isomerization of)

IT 81246-80-2P 81265-93-2P 81279-39-2P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. and phosphorylation of)

IT 81256-87-3P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. and phosphorylation of, with chlorophenyl  
 phosphorodichloridate)

IT 81246-76-6P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. and tert-butyldimethylsilylation of)

IT 81246-77-7P 81265-95-4P 81265-96-5P 81265-97-6P 81279-40-5P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)

IT 69504-12-7P 79974-68-8P 81265-94-3P 81265-98-7P 81265-99-8P  
 81266-00-4P 81266-01-5P 81266-02-6P 81266-03-7P 81266-04-8P  
 81266-05-9P 81279-41-6P 81279-42-7P 81279-43-8P 81279-44-9P  
 81279-45-0P 81279-46-1P 81279-47-2P 81279-48-3P 81279-49-4P  
 81279-50-7P 81294-84-0P 81412-73-9P 81412-74-0P 81412-76-2P  
 81458-80-2P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of, intermediate for oligoribonucleotide)

IT 65-46-3  
 RL: RCT (Reactant)  
 (N-benzylation of)

IT 81246-79-9 81246-82-4 81246-83-5  
 RL: RCT (Reactant)  
 (tert-butyldimethylsilylation of)

IT 81412-84-2P 81412-85-3P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (prepn. and deprotection of)

RN 81412-84-2 HCAPLUS

CN Adenosine, N-benzoyl-P-(4-chlorophenyl)-2',3'-bis-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-(2-methyl-1-oxopropyl)guanylyl-(5'.fwdarw.3')-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-(2-methyl-1-oxopropyl)guanylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]-N-(2-methyl-1-oxopropyl)guanylyl-(5'.fwdarw.3')-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]uridylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]cytidylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-N-benzoyl-5'-O-[bis(4-methoxyphenyl)phenylmethyl]-2'-O-[(1,1-dimethylethyl)dimethylsilyl]- (9CI)  
 (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

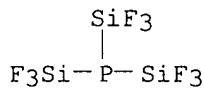
RN 81412-85-3 HCAPLUS

CN Adenosine, N-benzoyl-P-(4-chlorophenyl)-2',3'-bis-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-

chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-  
 (5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-  
 dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-  
 chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-  
 (5'.fwdarw.3')-N-benzoyl-P-(4-chlorophenyl)-2'-O-[(1,1-  
 dimethylethyl)dimethylsilyl]adenylyl-(5'.fwdarw.3')-N-benzoyl-P-(4-  
 chlorophenyl)-2'-O-[(1,1-dimethylethyl)dimethylsilyl]adenylyl-  
 (5'.fwdarw.3')-N-benzoyl-5'-O-[bis(4-methoxyphenyl)phenylmethyl]-2'-O-  
 [(1,1-dimethylethyl)dimethylsilyl]- (9CI) (CA INDEX NAME)

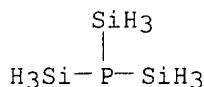
\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L24 ANSWER 18 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
 AN 1978:15322 HCAPLUS  
 DN 88:15322  
 TI Synthesis of a perfluoro compound of phosphorus and silicon.  
 Tris(trifluorosilyl)phosphine  
 AU Sharp, Kenneth G.  
 CS Univ. South. California, Los Angeles, Calif., USA  
 SO J. Chem. Soc., Chem. Commun. (1977), (16), 564-5  
 CODEN: JCCCAT  
 DT Journal  
 LA English  
 CC 78-8 (Inorganic Chemicals and Reactions)  
 AB P(SiF<sub>3</sub>)<sub>3</sub> was prep'd. from Hg-sensitized photolysis of Si<sub>2</sub>F<sub>6</sub> with PF<sub>3</sub> and  
 characterized by NMR, IR, and mass spectroscopy.  
 ST fluorosilylphosphine; silylphosphine fluoro; phosphine silylfluoro  
 IT 7783-55-3  
 RL: RCT (Reactant)  
 (photolysis of, with hexafluorodisilane)  
 IT 13830-68-7  
 RL: RCT (Reactant)  
 (photolysis of, with phosphorus trifluoride)  
 IT 64964-68-7P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)  
 IT 64964-68-7P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)  
 RN 64964-68-7 HCAPLUS  
 CN Phosphine, tris(trifluorosilyl)- (9CI) (CA INDEX NAME)



L24 ANSWER 19 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
 AN 1975:56990 HCAPLUS  
 DN 82:56990  
 TI NMR studies of silylphosphines. 11. Effects of substituents in silyl-  
 and silylmethylphosphines  
 AU Fritz, G.; Schaefer, H.  
 CS Inst. Anorg. Chem., Univ. Karlsruhe, Karlsruhe, Ger.  
 SO Z. Anorg. Allg. Chem. (1974), 409(2), 137-51  
 CODEN: ZAACAB  
 DT Journal  
 LA German

CC 22-2 (Physical Organic Chemistry)  
 AB The substituent effects on the 1H-, and 31P-NMR data were detd. for PH<sub>3</sub> and twenty four (MexSiH<sub>3-x</sub>)nPR<sub>3-n</sub> (x = 0-3, n = 1-3; R = H, Me). Empirical methods are presented for calcg. the 31P chem. shifts and the (29Si-31P) coupling consts. from band increment data.  
 ST NMR methylsilylphosphine; phosphine methylsilyl NMR; substituent effect  
 NMR methylsilylphosphine; silicon NMR methylsilylphosphine; phosphorus NMR methylsilylphosphine  
 IT Nuclear magnetic resonance  
     (of phosphorus-31 in methylsilylphosphines, substituent effects on)  
 IT Spin, nuclear coupling  
     (of phosphorus-31 with silicon-29 in methylsilylphosphines)  
 IT Substituent effect  
     (on phosphorus-31 coupling with silicon-29 in methylsilylphosphines)  
 IT 7723-14-0, properties  
 RL: PRP (Properties)  
     (NMR of, in methylsilylphosphines, substituent effects on)  
 IT 14616-42-3 14616-47-8 **15110-33-5** 15573-38-3 15573-39-4  
 17446-52-5 18148-18-0 18339-98-5 23685-79-2 23685-80-5  
 23685-81-6 26464-99-3 26465-30-5 32494-42-1 34752-41-5  
 34752-42-6 53380-72-6 53380-73-7 54253-36-0 54253-37-1  
 54253-38-2 54253-39-3 54290-37-8 54290-38-9  
 RL: PROC (Process)  
     (PMR and phosphorus-31 NMR of)  
 IT 14304-87-1, properties  
 RL: RCT (Reactant)  
     (coupling of, with phosphorus-31 in NMR of methylsilylphosphine, substituent effects on)  
 IT 7803-51-2  
 RL: PRP (Properties)  
     (phosphorus-31 NMR of, substituent effects in methylsilylphosphines in relation to)  
 IT **15110-33-5**  
 RL: PROC (Process)  
     (PMR and phosphorus-31 NMR of)  
 RN 15110-33-5 HCPLUS  
 CN Phosphine, trisilyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



L24 ANSWER 20 OF 23 HCPLUS COPYRIGHT 2002 ACS  
 AN 1974:536247 HCPLUS  
 DN 81:136247  
 TI Metalation of the phosphino group in silylphosphines  
 AU Fritz, G.; Schaefer, H.; Hoelderich, W.  
 CS Inst. Anorg. Chem., Univ. Karlsruhe, Karlsruhe, Ger.  
 SO Z. Anorg. Allg. Chem. (1974), 407(3), 266-86  
 CODEN: ZAACAB  
 DT Journal  
 LA German  
 CC 29-7 (Organometallic and Organometalloidal Compounds)  
 AB MexH<sub>3-x</sub>SiPH<sub>2</sub> (x = 0 and 2) reacted with Et<sub>2</sub>PLi at molar ratio 1:2 in diglyme at low temp. to give MexH<sub>3-x</sub>SiPLi<sub>2</sub> which reacted with MeCl to give MexH<sub>3-x</sub>SiPMe<sub>2</sub>. MexH<sub>3-x</sub>SiPH<sub>2</sub> (x = 0-3) reacted with MePHLi to give MexH<sub>3-x</sub>SiPHLi which disproportionated in solns. of mono-, di-, or triglyme

at room temp. or on addn. of nonpolar solvents into  $(\text{MeH}_3\text{-xSi})_2\text{PLi}$  and  $\text{LiPH}_2$ .  $(\text{MeH}_3\text{-xSi})_2\text{PLi}$  etherates were obtained from these solns. after pptn. of  $\text{LiPH}_2$  with benzene and evapn. of the solvent. The etherate of  $(\text{Me}_3\text{Si})_2\text{PLi}$  reacted in benzene with  $\text{MeCl}$  to give  $(\text{Me}_3\text{Si})_2\text{PMe}$ , and  $(\text{MeSiH}_2)\text{PLi}$  reacted with  $\text{MeSiH}_2\text{Br}$  to give  $(\text{MeSiH}_2)_3\text{P}$ .  $\text{MeH}_3\text{-xSiPHLi}$  ( $x = 0$  and  $2$ ) reacted with  $\text{AlCl}_3$  in diglyme to give  $\text{LiAl}(\text{PHSi-H}_3\text{-xMex})_4$  which reacted with  $\text{MeCl}$  and  $\text{H}_3\text{SiBr}$  to give  $\text{MeH}_3\text{-x-SiPHMe}$  and  $(\text{MeH}_3\text{-xSi})_2\text{PH}$ , resp. Compds. contg.  $\text{Al-P-(SiH}_3)_2$  and  $\text{Al-PH}_2$  moieties formed also in this reaction reacted with halosilanes to give tri- and monosilylphosphines, resp., which were also formed by partial disproportionation of the disilylphosphines. The NMR data of the compds. were reported.

ST phosphine silyl metalation; silylphosphine metalation; lithium silylphosphine; ethylphosphinolithium reaction silylphosphine; methyl chloride silylphosphinolithium; monoglyme silylphosphinolithium adduct; halosilane reaction silylphosphinolithium; aluminum lithium silylphosphine

IT Metalation  
(of silylphosphines by lithium)

IT 54253-40-6  
RL: RCT (Reactant)  
(as intermediate from metalation from silylphosphines)

IT 54253-42-8 54253-43-9 54253-44-0 54253-45-1 54253-46-2  
54253-47-3 54253-48-4  
RL: RCT (Reactant)  
(as intermediates from metalation from silylphosphines)

IT 54330-83-5P 54330-84-6P  
RL: RCT (Reactant); PREP (Preparation)  
(by metalation of silylphosphines in the presence of aluminum trichloride, reactions of)

IT 7803-51-2 14616-47-8 17446-52-5 26465-30-5 32494-42-1  
RL: RCT (Reactant)  
(metalation of)

IT 109-72-8, reactions 19093-80-2 54253-41-7  
RL: RCT (Reactant)  
(metalation of silylphosphines by)

IT 593-54-4P 1605-58-9P 14616-42-3P 15110-33-5P 22423-53-6P  
23685-81-6P 34752-41-5P 53380-73-7P 54253-36-0P 54253-37-1P  
54253-38-2P 54253-39-3P 54290-37-8P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of)

IT 74-87-3  
RL: RCT (Reactant)  
(reaction with metalated silylphosphine)

IT 1631-88-5 2441-22-7  
RL: RCT (Reactant)  
(reaction with metalated silylphosphines)

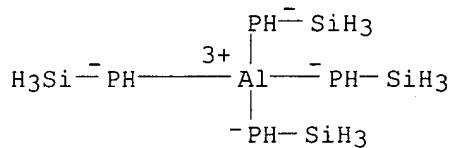
IT 13465-73-1  
RL: RCT (Reactant)  
(reaction with metalated silylphosphines in the presence of aluminum trichloride)

IT 7446-70-0, reactions  
RL: RCT (Reactant)  
(with silylphosphines and lithium agents)

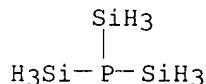
IT 54330-83-5P  
RL: RCT (Reactant); PREP (Preparation)  
(by metalation of silylphosphines in the presence of aluminum trichloride, reactions of)

RN 54330-83-5 HCPLUS

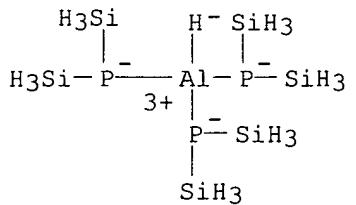
CN Aluminate(1-), tetrakis(silylphosphino)-, lithium, (T-4)- (9CI) (CA INDEX NAME)



IT 15110-33-5P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)  
 RN 15110-33-5 HCPLUS  
 CN Phosphine, trisilyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



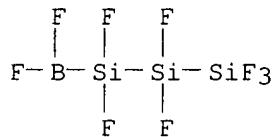
L24 ANSWER 21 OF 23 HCPLUS COPYRIGHT 2002 ACS  
 AN 1971:483686 HCPLUS  
 DN 75:83686  
 TI Silicon-phosphorus hydrides. IV. Disilylphosphinoaluminate anion  
 AU Drake, J. E.; Anderson, J. W.  
 CS Dep. Chem., Univ. Windsor, Windsor, Ont., Can.  
 SO J. Chem. Soc. A (1971), (13), 2246-8  
 CODEN: JCSIAAP  
 DT Journal  
 LA English  
 CC 78 (Inorganic Chemicals and Reactions)  
 AB Trisilylphosphine reacts with  $\text{LiAlH}_4$  to give a disilylphosphinoaluminate ion. The characterization of the latter resulted in the formation of methyl-, trimethylsilyl-, and disilanyl-(disilyl)phosphine.  
 ST silylphosphinoaluminate; aluminate silylphosphino; phosphinoaluminate  
 IT Phosphine, disilyl-, aluminum complexes  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)  
 IT 33296-83-2  
 RL: PRP (Properties)  
 (nuclear magnetic resonance of)  
 IT 33296-82-1P 33661-24-4P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)  
 IT 33661-24-4P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)  
 RN 33661-24-4 HCPLUS  
 CN Aluminate(1-), tris(disilylphosphino)hydro-, lithium (8CI) (CA INDEX NAME)



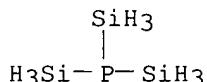
● Li<sup>+</sup>

L24 ANSWER 22 OF 23 HCPLUS COPYRIGHT 2002 ACS  
 AN 1968:116090 HCPLUS  
 DN 68:116090  
 TI Perfluoroborosilanes  
 IN Margrave, John L.; Timms, Peter L.; Ehlert, Thomas C.  
 PA R. I. Patents, Inc.  
 SO U.S., 5 pp.  
 CODEN: USXXAM  
 DT Patent  
 LA English  
 NCL 023367000  
 CC 49 (Industrial Inorganic Chemicals)  
 FAN.CNT 1

| PATENT NO.   | KIND | DATE     | APPLICATION NO. | DATE     |
|--|------|----------|-----------------|----------|
| PI US 3379512  | A    | 19680423 | US 1965-462099  | 19650607 |
| AB Si <sub>2</sub> BF <sub>7</sub> and its homologs are prep'd. by condensing mixts. of gaseous BF <sub>3</sub> and gaseous SiF <sub>2</sub> at temps. below the condensation temp. of the resp. compds. The mixts. can be prep'd. from the resp. gases, or by contacting Si with gaseous BF <sub>3</sub> at 1000-400.degree., or by contacting B with gaseous SiF <sub>4</sub> at 1000-2000.degree.. Thus, cryst. Si was placed in a graphite tube enclosed by an evacuated quartz envelope connected to a high vacuum system via a liq. N-cooled trap. Gaseous BF <sub>3</sub> was passed over the Si at 1150.degree. and a pressure of 0.1-0.3 mm. Hg abs. The condensate collected in the cold trap was shown by mass spectrometric examn. to consist of Si <sub>2</sub> BF <sub>7</sub> , Si <sub>3</sub> BF <sub>9</sub> , and their higher homologs. These compds. are useful for depositing adherent layers of Si on glass or metal objects. They also form stable complexes with ternary amines, useful as catalysts for hardening epoxy resins. A soln. of Si <sub>2</sub> BF <sub>7</sub> in Me <sub>2</sub> CO is a powerful reducing agent. |      |          |                 |          |
| ST BORO PERFLUORO SILANES; SILANES PERFLUORO BORO; FLUORO BORO SILANES; PERFLUOROBOROSILANES   |      |          |                 |          |
| IT Coating materials<br>(silicon, on iron, from difluoro(pentafluorodisilanyl)borane, corrosion- and oxidn.-resistant)   |      |          |                 |          |
| IT 14890-36-9P 14890-37-0P<br>RL: IMF (Industrial manufacture); PREP (Preparation)<br>(manuf. of, from borontrifluoride and silicon)   |      |          |                 |          |
| IT 14890-37-0P<br>RL: IMF (Industrial manufacture); PREP (Preparation)<br>(manuf. of, from borontrifluoride and silicon)   |      |          |                 |          |
| RN 14890-37-0 HCPLUS<br>CN Borane, difluoro(heptafluorotrisilanyl)- (7CI, 8CI) (CA INDEX NAME)   |      |          |                 |          |



L24 ANSWER 23 OF 23 HCPLUS COPYRIGHT 2002 ACS  
 AN 1967:101248 HCPLUS  
 DN 66:101248  
 TI Some new adducts of iodosilane  
 AU Aylett, Bernard J.; Sinclair, Robert A.  
 CS Westfield Coll., London, Engl.  
 SO Proc. Int. Conf. Coord. Chem., 8th (1964), 166-7  
 CODEN: 16IPAC  
 DT Conference  
 LA English  
 CC 78 (Inorganic Chemicals and Reactions)  
 AB Adducts of SiH<sub>3</sub>I with two mols. of org. base B (B = pyridine, 2-hexylpyridine, collidine) were prep'd. by reaction of B and SiH<sub>3</sub>I at low temp., with or without an inert solvent. These compds., particularly the 2-hexylpyridine adduct (I), are useful as silylating agents. Trisilylphosphine was prep'd. by the action of I on PH<sub>3</sub> in Bu<sub>3</sub>N.  
 ST IODOSILANES ADDUCTS; PYRIDINES IODOSILANES; HEXYLPYRIDINES IODOSILANES  
 IT Silylation catalysts  
     (iodosilane adducts with org. bases as)  
 IT 2,2'-Bipyridine, silicon complex  
 Pyridine, silicon complex  
 Pyridine, 2,4,6-trimethyl-, silicon complex  
 Pyridine, 2-hexyl-, silicon complex  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
     (prepn. of)  
 IT 13960-82-2P 15110-33-5P 15469-31-5P 15469-32-6P  
 15469-33-7P 15597-96-3P 16961-94-7P 16961-95-8P 16961-96-9P  
 16961-97-0P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
     (prepn. of)  
 IT 15110-33-5P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
     (prepn. of)  
 RN 15110-33-5 HCPLUS  
 CN Phosphine, trisilyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



*Removed undesired elements  
from structure set.*

=> D QUE  
 L3 48753 SEA FILE=REGISTRY ABB=ON (SI(L)(H OR F OR CL OR BR OR I)(L)(B  
     OR P))/ELS  
 L4 8214 SEA FILE=REGISTRY ABB=ON L3 AND 3-60/SI  
 L5 402 SEA FILE=REGISTRY ABB=ON L4 NOT 1-300/C  
 L6 149 SEA FILE=REGISTRY ABB=ON L5 NOT (1-10/O OR 1-10/N)  
 L11 101 SEA FILE=REGISTRY ABB=ON L6 NOT 11-40/O

|     |                             |  |
|-----|-----------------------------|--|
| L12 | 74 SEA FILE=HCAPLUS ABB=ON  | L11  |
| L13 | 2 SEA FILE=HCAPLUS ABB=ON   | L12 AND (INKJET? OR INK(W) JET)                          |
| L14 | 5 SEA FILE=HCAPLUS ABB=ON   | L11(L) FILM#   |
| L15 | 3 SEA FILE=HCAPLUS ABB=ON   | L11 AND COATING?/SC, SX, AB, BI                          |
| L16 | 2 SEA FILE=HCAPLUS ABB=ON   | L11 AND INK#   |
| L17 | 7 SEA FILE=HCAPLUS ABB=ON   | (L13 OR L14 OR L15 OR L16)                               |
| L18 | 1 SEA FILE=HCAPLUS ABB=ON   | L12 AND GLASS?   |
| L21 | 21 SEA FILE=HCAPLUS ABB=ON  | L12(L) (PREP OR IMF OR SPN OR TEM OR<br>PROC OR PEP) /RL |
| L22 | 23 SEA FILE=HCAPLUS ABB=ON  | L17 OR L18 OR L21  |
| L23 | 1 SEA FILE=HCAPLUS ABB=ON   | L12 AND REPROG?/SC, SX                                   |
| L24 | 23 SEA FILE=HCAPLUS ABB=ON  | L22 OR L23   |
| L25 | 94 SEA FILE=REGISTRY ABB=ON | L11 NOT 1-100/N  |
| L26 | 91 SEA FILE=REGISTRY ABB=ON | L25 NOT 301-600/C  |
| L27 | 87 SEA FILE=REGISTRY ABB=ON | L26 NOT 1-20/LI, CO, AL                                  |
| L28 | 85 SEA FILE=REGISTRY ABB=ON | L27 NOT 1-20/PT, RU                                      |
| L29 | 83 SEA FILE=REGISTRY ABB=ON | L28 NOT 1-10/NI, S                                       |
| L32 | 48 SEA FILE=REGISTRY ABB=ON | L29 AND 1-200/NR   |
| L33 | 18 SEA FILE=HCAPLUS ABB=ON  | L32  |
| L34 | 11 SEA FILE=HCAPLUS ABB=ON  | (L24 OR L33) NOT L24                                     |

=> D L34 ALL 1-11 HITSTR

*no utility required for these  
structures in Chemical  
Abstracts*

L34 ANSWER 1 OF 11 HCAPLUS COPYRIGHT 2002 ACS  
 AN 2000:216555 HCAPLUS  
 DN 133:321932  
 TI Will an .eta.3-Si3H3 ligand form sandwich compounds with main group elements?. [Erratum to document cited in CA132:279265]  
 AU Srinivas, Gantasala N.; Hamilton, Tracy P.; Jemmis, Eluvathingal D.; McKee, Michael L.; Lammertsma, Koop  
 CS Department of Chemistry, University of Alabama at Birmingham, Birmingham, AL, 35294, USA  
 SO Journal of the American Chemical Society (2000), 122(15), 3799  
 CODEN: JACSAT; ISSN: 0002-7863  
 PB American Chemical Society  
 DT Journal  
 LA English  
 CC 29-6 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 22, 65  
 AB On page 1727, the last column of Table 1, the relative energies for structures 7-B+ through 10, was omitted; this portion of the table is reprinted.  
 ST erratum trisilacycloprenium sandwich compd beryllium boron carbon density functional; trisilacycloprenium sandwich compd beryllium boron carbon density functional erratum; beryllium complex trisilacycloprenium density functional erratum; carbon complex trisilacycloprenium density functional theory erratum; boron complex trisilacycloprenium density functional erratum; silicon trisilacycloprenium ligand main group complex density functional erratum; main group trisilacycloprenium sandwich structure density functional erratum  
 IT Density functional theory  
     (B3LYP; d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon (Erratum))  
 IT Sandwich compounds  
     RL: PRP (Properties)  
     (d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon (Erratum))  
 IT Natural bond orbital

(electron distribution in beryllium, boron and carbon complexes with trisilacycloprenium cation studied by (Erratum))

IT Total energy  
 (of beryllium, boron and carbon complexes with trisilacycloprenium cation (Erratum))

IT Molecular structure  
 (optimized; d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon (Erratum))

IT Main group element compounds

RL: PRP (Properties)  
 (trisilacycloprenium complexes; d.-functional theor. study of structure min. for beryllium, boron and carbon (Erratum))

IT 263351-46-8 263351-47-9 263351-48-0 263351-49-1  
 263351-50-4 263351-53-7 263351-54-8 263389-94-2 263389-95-3  
 263389-96-4 263389-98-6 263708-80-1  
 RL: PRP (Properties)  
 (d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon (Erratum))

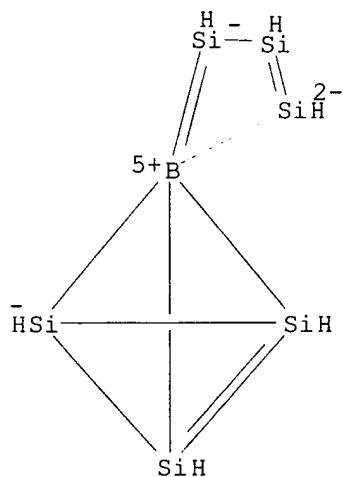
IT 263351-45-7  
 RL: PRP (Properties)  
 (unbridged and .mu.-hydro bridged forms; d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon (Erratum))

IT 263351-51-5  
 RL: PRP (Properties)  
 (.mu.-hydro bridged forms; d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon (Erratum))

IT 263351-46-8 263351-48-0  
 RL: PRP (Properties)  
 (d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon (Erratum))

RN 263351-46-8 HCAPLUS

CN Boron(1+), (.eta.3-2-cyclotrisilen-1-yl)-1-trisilen-1-yl-3-ylidene- (9CI)  
 (CA INDEX NAME)



RN 263351-48-0 HCAPLUS  
 CN Boron(1+), bis(1-trisilen-1-yl-3-ylidene)-, (T-4)- (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

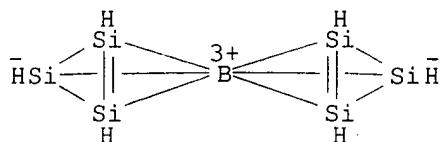
IT 263351-45-7

RL: PRP (Properties)

(unbridged and .mu.-hydro bridged forms; d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon (Erratum))

RN 263351-45-7 HCAPLUS

CN Boron(1+), bis(.eta.3-2-cyclotrisilene-1-yl)- (9CI) (CA INDEX NAME)



L34 ANSWER 2 OF 11 HCAPLUS COPYRIGHT 2002 ACS

AN 2000:104812 HCAPLUS

DN 132:279265

TI Will an .eta.3-Si3H3 Ligand Form Sandwich Compounds with Main Group Elements?

AU Srinivas, Gantasala N.; Hamilton, Tracy P.; Jemmis, Eluvathingal D.; McKee, Michael L.; Lammertsma, Koop

CS Department of Chemistry, University of Alabama at Birmingham, Birmingham, AL, 35294, USA

SO Journal of the American Chemical Society (2000), 122(8), 1725-1728  
CODEN: JACSAT; ISSN: 0002-7863

PB American Chemical Society

DT Journal

LA English

CC 29-6 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 22, 65

AB .eta.3-Si3H3 sandwich compds. 5 and 6, with classical and H-bridged ligands, resp., having the main group elements B and C as central atoms are min. at B3LYP/6-311++G(2d,2p). The stability of these systems is assisted by transfer of charge from the ligands to the central atom and is reversed from that of cyclopentadienyl sandwiches. The C and B contg. pyramidal complexes, contg. both a .eta.3-Si3H3 and a .mu.2-Si3H3 ligand, are more stable than 5 by 20.7 and 8.5 kcal/mol, resp. The spiro compds., in which the C and B atoms are sandwiched by two allylic .mu.2-Si3H3 ligands, are still more stable by 29.6 and 21.9 kcal/mol, resp. All three types (face-face, face-side, side-side) of sandwich structures are considered viable targets for synthetic pursuit. The Be complexes deviate from the C and B analogs because Be is much more electropos. In the preferred cluster structure the Be atom sits in a Si6H6 basket.

ST trisilacycloprenium sandwich compd beryllium boron carbon density functional; beryllium complex trisilacycloprenium density functional theory; boron complex trisilacycloprenium density functional theory; carbon complex trisilacycloprenium density functional theory; silicon trisilacycloprenium ligand main group complex density functional; main group trisilacycloprenium sandwich structure density functional

IT Density functional theory

(B3LYP; d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon)

IT Sandwich compounds

RL: PRP (Properties)

(d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon)

IT Natural bond orbital  
 (electron distribution in beryllium, boron and carbon complexes with trisilacycloprenium cation studied by)

IT Total energy  
 (of beryllium, boron and carbon complexes with trisilacycloprenium cation)

IT Molecular structure  
 (optimized; d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon)

IT Main group element compounds

RL: PRP (Properties)  
 (trisilacycloprenium complexes; d.-functional theor. study of structure min. for beryllium, boron and carbon)

IT **263351-46-8** 263351-47-9 **263351-48-0** 263351-49-1  
 263351-50-4 263351-53-7 263351-54-8 263389-95-3 263389-96-4  
 263389-98-6 263708-80-1  
 RL: PRP (Properties)  
 (d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon)

IT **263351-45-7** 263389-94-2  
 RL: PRP (Properties)  
 (unbridged and .mu.-hydro bridged forms; d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon)

IT 263351-51-5  
 RL: PRP (Properties)  
 (.mu.-hydro bridged forms; d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon)

RE.CNT 51 THERE ARE 51 CITED REFERENCES AVAILABLE FOR THIS RECORD

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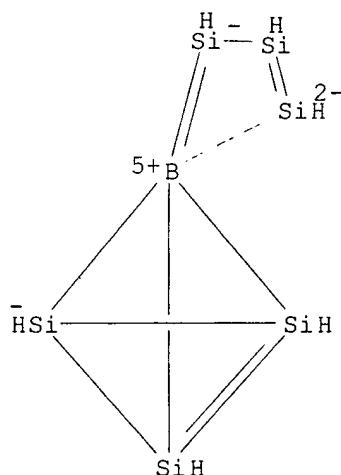
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IT 263351-46-8 263351-48-0

RL: PRP (Properties)

(d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon)

RN 263351-46-8 HCPLUS

CN Boron(1+), (.eta.3-2-cyclotrisilen-1-yl)-1-trisilen-1-yl-3-ylidene- (9CI)  
(CA INDEX NAME)

RN 263351-48-0 HCPLUS

CN Boron(1+), bis(1-trisilen-1-yl-3-ylidene)-, (T-4)- (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

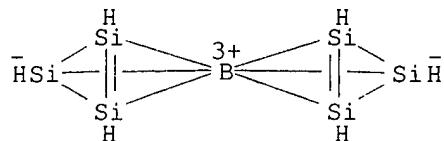
IT 263351-45-7

RL: PRP (Properties)

(unbridged and .mu.-hydro bridged forms; d.-functional theor. study of structure min. for trisilacycloprenium complexes with beryllium, boron and carbon)

RN 263351-45-7 HCPLUS

CN Boron(1+), bis(.eta.3-2-cyclotrisilien-1-yl)- (9CI) (CA INDEX NAME)

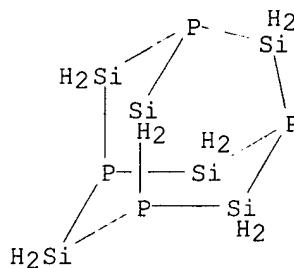


L34 ANSWER 3 OF 11 HCAPLUS COPYRIGHT 2002 ACS  
 AN 1999:694692 HCAPLUS  
 DN 132:29956  
 TI Density functional study of tricyclo[3.3.1.13,7]decsilane derivatives of P, Al, As and Ga ((SiH<sub>2</sub>)<sub>6</sub>M<sub>4</sub>, M = P, Al, As or Ga)  
 AU Lu, Li-Hwa  
 CS Department of Physics and Chemistry, Chinese Military Academy, Feng-Shan, Kaohsuing, 830, Peop. Rep. China  
 SO Huaxue (1999), 57(2), 89-101  
 CODEN: HUHSA2; ISSN: 0441-3768  
 PB Chinese Chemical Society  
 DT Journal  
 LA Chinese  
 CC 78-8 (Inorganic Chemicals and Reactions)  
 Section cross-reference(s): 22  
 AB The B3LYP/6-31G\* d. functional method from Gaussian 94 program package was applied to tricyclo[3.3.1.13'7]decsilane derivs. ((SiH<sub>2</sub>)<sub>6</sub>M<sub>4</sub>, M = P, Al, As or Ga). From the calcn., the structures, ionization potentials, HOMO and LUMO energies, energy gaps, heat of formations, atomization energies, and vibrational frequencies of these mols. were attained. The results show that (SiH<sub>2</sub>)<sub>6</sub>P<sub>4</sub>, (SiH<sub>2</sub>)<sub>6</sub>As<sub>4</sub>, (SiH<sub>2</sub>)<sub>6</sub>Al<sub>4</sub> and (SiH<sub>2</sub>)<sub>6</sub>Ga<sub>4</sub> are all stable mols. with (SiH<sub>2</sub>)<sub>6</sub>P<sub>4</sub> and (SiH<sub>2</sub>)<sub>6</sub>Al<sub>4</sub> mols. which are more stable than (SiH<sub>2</sub>)<sub>6</sub>As<sub>4</sub> and (SiH<sub>2</sub>)<sub>6</sub>Ga<sub>4</sub> mols. The (SiH<sub>2</sub>)<sub>6</sub>Ga<sub>4</sub> and (SiH<sub>2</sub>)<sub>6</sub>Al<sub>4</sub> mols. have larger cond. among all of the four derivs.  
 ST density functional calcn tricyclodecsilane deriv phosphorus aluminum arsenic gallium; ionization potential vibrational frequency tricyclodecsilane phosphorus aluminum arsenic gallium; heat formation tricyclodecsilane deriv phosphorus aluminum arsenic gallium  
 IT Density functional theory  
     (B3LYP; d. functional study of tricyclodecsilane derivs. of phosphorus, aluminum, arsenic, and gallium)  
 IT Atomization enthalpy  
     Formation enthalpy  
     HOMO (molecular orbital)  
     Ionization potential  
     LUMO (molecular orbital)  
     Total energy  
     Vibrational frequency  
         (d. functional study of tricyclodecsilane derivs. of phosphorus, aluminum, arsenic, and gallium)  
 IT Molecular structure  
     (optimized; d. functional study of tricyclodecsilane derivs. of phosphorus, aluminum, arsenic, and gallium)  
 IT 68024-86-2 75507-82-3 155101-73-8, Tricyclo[3.3.1.13,7]decasilane 252027-43-3 252027-45-5  
     RL: PRP (Properties)  
         (d. functional study of tricyclodecsilane derivs. of phosphorus, aluminum, arsenic, and gallium)  
 IT 68024-86-2

RL: PRP (Properties)

(d. functional study of tricyclodecsilane derivs. of phosphorus, aluminum, arsenic, and gallium)

RN 68024-86-2 HCAPLUS

CN 1,3,5,7-Tetraphospha-2,4,6,8,9,10-hexasilatricyclo[3.3.1.13,7]decane (9CI)  
(CA INDEX NAME)

L34 ANSWER 4 OF 11 HCAPLUS COPYRIGHT 2002 ACS

AN 1997:458059 HCAPLUS

DN 127:176557

TI Through-bond interactions in silicon-phosphorus and silicon-arsenic compounds: a facile synthesis of dodecamethyl-2,3,5,6,7,8-hexasila-1.lambda.3,4.lambda.3-diphosphabicyclo[2.2.2]octane, its arsenic analog, and related compounds

AU Winkler, Uwe; Schieck, Mathias; Pritzkow, Hans; Driess, Matthias; Hyla-Kryspin, Isabella; Lange, Holger; Gleiter, Rolf

CS Anorganische-Chemisches Institut Universitat Heidelberg, D-69120, Germany

SO Chemistry--A European Journal (1997), 3(6), 874-880  
CODEN: CEUJED; ISSN: 0947-6539

PB Wiley-VCH

DT Journal

LA English

CC 29-14 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 22, 75

OS CASREACT 127:176557

AB Dodecamethyl-2,3,5,6,7,8-hexasila-1.lambda.3,4.lambda.3-diphosphabicyclo[2.2.2]octane (1) and its As analog 2 are readily accessible in 69 and 73% yield, resp., by the cyclocondensation reaction of 1,2-dichloro-1,1,2,2-tetramethyldisilane (5) with the Li pnictides [LiEH<sub>2</sub>(dme)] (E = P (6), As; dme = 1,2-dimethoxyethane). The reactions proceed via 1,4-diphosphaoctamethyltetrasilacyclohexane (8) and its As analog 9, resp., which were isolated and structurally characterized by x-ray crystallog. The mol. structures of 1 and 2, which are isotopic, were also established by single-crystal x-ray anal.: they possess D3 point symmetry with the expected Si-E bond lengths (E = P, As) but unusually long Si-Si bonds. The latter are 0.02-0.03 .ANG. longer than those in 8 and 9, mainly due to through-bond interactions (TB) between donating n orbitals of the E atoms and the .sigma.\* acceptor orbitals of the Si-Si bond. The 1st expanded analogs of 1, namely, 12 and 14, with hexamethyltrisilane and dodecamethylhexasilane chains bridging the two P atoms, were synthesized in a 1-pot cyclocondensation reaction of the corresponding 1,3- and 1,6-dichlorooligosilanes, resp., with 6. Ab initio calcns. on the parent compds. 1a, 12a, and the 2nd-row analog 1,4-diazabicyclo[2.2.2]octane (B) were carried out to analyze the different coupling consts. and magnitudes of intramol. interactions (through-space/through-bond coupling). TS and TB coupling in B are about

two times stronger than in the congener 1a, due to the compactness of the N2C6 skeleton and the greater extent of s,p hybridization at N. Evidence for TB interactions in 1 was obtained by photoelectron spectroscopy and by comparison of the two 1st vertical ionization potentials with calcd.

values for 1a. The best agreement with exptl. data was achieved when 1a was calcd. at the MP2 level. 1A preferentially adopts D3 point symmetry; the higher-symmetry D3h form possesses one imaginary frequency and is slightly less stable (0.46 kcal mol<sup>-1</sup> at HF/6-31G\*//HF/6-31G\* and 1.58 kcal mol<sup>-1</sup> at MP2/6-31G\*//HF/6-31G\* level), suggesting that this structure corresponds to a transition state on the potential energy surface. The structures corresponding to the global min. of B and 12a have D3h and C3h symmetry, resp. At the HF/6-31G\*//HF/6-31G\* level the D3h form of 12a is 17.61 kcal mol<sup>-1</sup> less stable than the C3h min.

ST crystal structure arsasila phosphasila cage ring; mol structure arsasila phosphasila cage ring; electronic structure phosphasila cage; ab initio phosphasila cage; MP2 phosphasila cage; ionization energy phosphasila cage; through bond space interaction phosphasila cage; arsenic silicon cage ring prepn structure; phosphorus silicon cage ring prepn structure; silicon arsenic phosphorus cage ring prepn; cage arsenic phosphorus silicon prepn; ring arsenic phosphorus silicon prepn; cyclocondensation arsasila phosphasila cage ring prepn

IT Photoemission

(from phosphorus-silicon vs. diazabicyclooctane cages)

IT Through-bond interaction

Through-space interaction

(in phosphorus-silicon vs. diazabicyclooctane cages)

IT HF MO (molecular orbital)

MP2 (Moller-Plesset)

Natural bond orbital

(intramol. interactions in phosphorus-silicon cages studied by)

IT Crystal structure

Molecular structure

(of arsenic-silicon and phosphorus-silicon rings and cages)

IT Cyclocondensation reaction

(of dichlorooligosilanes with arsenide and phosphide)

IT Ionization potential

(of phosphorus-silicon vs. diazabicyclooctane cages)

IT Heterocyclic compounds

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(pnictogen-silicon; prepn. and crystal structure of)

IT Cage compounds

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(pnictogen-silicon; prepn., crystal structure and ab initio studies of)

IT Group VA element compounds

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(prepn., crystal structure and ab initio studies of pnictogen-silicon)

IT 194030-93-8P

RL: SPN (Synthetic preparation); PREP (Preparation)

(7 3j)

IT 86472-18-6 194030-95-0

RL: PRP (Properties)

(ab initio studies of intramol. electronic interactions in)

IT 280-57-9, 1,4-Diazabicyclo[2.2.2]octane

RL: PRP (Properties)

(ab initio studies of intramol. electronic interactions in phosphorus-silicon cages vs.)

IT 4342-61-4, 1,2-Dichloro-1,1,2,2-tetramethyldisilane

RL: RCT (Reactant); RACT (Reactant or reagent)

(for prepn. of arsenic-silicon and phosphorus-silicon rings and cages)

IT 138435-85-5

IT 812-36-2 812-54-4  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (for prepn. of arsenic-silicon rings and cages)

IT 62263-24-5  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (for prepn. of phosphorus-silicon cage)

IT 121240-26-4P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (improved prepn. and crystal structure of)

IT 86263-33-4P  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT  
 (Reactant); SPN (Synthetic preparation); PREP (Preparation); PROC  
 (Process); RACT (Reactant or reagent)  
 (improved prepn., crystal structure, adduct formation with borane,  
 photoemission and intramol. electronic interactions in)

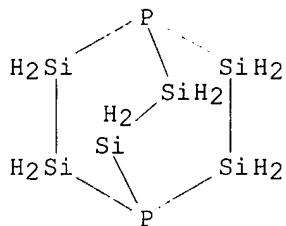
IT 194030-89-2P 194030-91-6P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of)

IT 194030-85-8P 194030-87-0P  
 RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (prepn., crystal structure and cyclocondensation reaction with  
 dichlorodisilane)

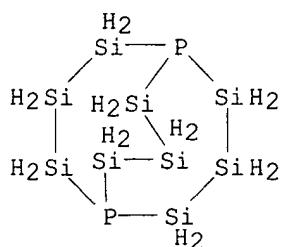
IT 86472-18-6 194030-95-0  
 RL: PRP (Properties)  
 (ab initio studies of intramol. electronic interactions in)

RN 86472-18-6 HCPLUS

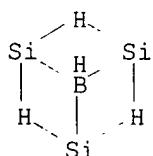
CN 1,4-Diphospho-2,3,5,6,7,8-hexasilabicyclo[2.2.2]octane (9CI) (CA INDEX  
 NAME)



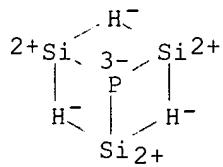
RN 194030-95-0 HCPLUS  
 CN 1,5-Diphospho-2,3,4,6,7,8,9,10,11-nonasilabicyclo[3.3.3]undecane (9CI)  
 (CA INDEX NAME)



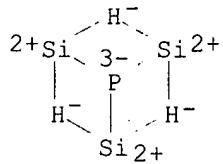
L34 ANSWER 5 OF 11 HCAPLUS COPYRIGHT 2002 ACS  
 AN 1996:189271 HCAPLUS  
 DN 124:271028  
 TI Contrasting Stabilities of Classical and Bridged Pyramidal Si<sub>3</sub>H<sub>3</sub>X Molecules (X = BH<sup>-</sup>, CH, N, NH<sup>+</sup>, NO, SiH, P, PH<sup>+</sup>, and PO)  
 AU Jemmis, Eluvathingal D.; Srinivas, Gantasala Naga  
 CS School of Chemistry, University of Hyderabad, Hyderabad, 500 046, India  
 SO J. Am. Chem. Soc. (1996), 118(15), 3738-42  
 CODEN: JACSAT; ISSN: 0002-7863  
 DT Journal  
 LA English  
 CC 65-5 (General Physical Chemistry)  
 Section cross-reference(s): 29, 78  
 AB Trigonal-pyramidal Si<sub>3</sub>H<sub>3</sub>X systems have been studied at HF/6-31G\*, MP2(FC)/6-31G\*, and Becke3LYP/6-31G\* levels. The classical trigonal-pyramidal structure (5) is a higher-order stationary point for X = BH<sup>-</sup>, CH, NO, SiH, P, PH<sup>+</sup>, and PO, whereas it is a min. for X = N and NH<sup>+</sup>, at the MP2(FC)/6-31G\* level. An alternative pyramidal structure (6, C<sub>3</sub>v) with three SiHSi 3c-2e bonds is min., lower in energy than 5 by 47.7 (X = BH<sup>-</sup>), 39.1 (X = CH), 31.7 (X = N), 25.0 (X = NH<sup>+</sup>), 20.6 (X = SiH), 20.7 (X = P), 16.1 (X = PH<sup>+</sup>), and 18.2 (X = PO) kcal/mol. Isolobal analogy connects 6 with various triply hydrogen bridged pyramidal structures in organometallics.  
 ST total energy pyramidal silicon hydride compd; mol structure pyramidal silicon hydride compd; stability trigonal pyramidal silicon hydride compd  
 IT Energy, total  
 (of trigonal-pyramidal silicon hydride compds. (Si<sub>3</sub>H<sub>3</sub>X, X = BN<sup>-</sup>, CH, N, NH<sup>+</sup>, NO, SiH, P, PH<sup>+</sup>, and PO) studied theor. with quantum calcns.)  
 IT Molecular structure determination  
 (calcn., of trigonal-pyramidal silicon hydride compds. (Si<sub>3</sub>H<sub>3</sub>X, X = BN<sup>-</sup>, CH, N, NH<sup>+</sup>, NO, SiH, P, PH<sup>+</sup>, and PO) studied theor. with quantum calcns.)  
 IT 79517-89-8, Tricyclo[1.1.0.02,4]tetrasilane 175481-87-5  
 175481-88-6 175481-89-7 175481-90-0 175481-91-1  
 175481-92-2 175556-20-4 175616-96-3  
 RL: PRP (Properties)  
 (mol. structures and total energies of trigonal-pyramidal silicon hydride compds. (Si<sub>3</sub>H<sub>3</sub>X, X = BN<sup>-</sup>, CH, N, NH<sup>+</sup>, NO, SiH, P, PH<sup>+</sup>, and PO) studied theor. with quantum calcns.)  
 IT 175481-87-5 175481-91-1 175481-92-2  
 RL: PRP (Properties)  
 (mol. structures and total energies of trigonal-pyramidal silicon hydride compds. (Si<sub>3</sub>H<sub>3</sub>X, X = BN<sup>-</sup>, CH, N, NH<sup>+</sup>, NO, SiH, P, PH<sup>+</sup>, and PO) studied theor. with quantum calcns.)  
 RN 175481-87-5 HCAPLUS  
 CN Borate(1-), hydro[tri-.mu.-hydrotrisilicato(3-)]- (9CI) (CA INDEX NAME)



RN 175481-91-1 HCAPLUS  
 CN Silicon, tri-.mu.-hydro-.mu.3-phosphidotri- (9CI) (CA INDEX NAME)



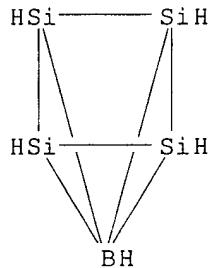
RN 175481-92-2 HCAPLUS  
 CN Silicon, tri-.mu.-hydro-.mu.3-phosphidotri-, conjugate acid (9CI) (CA  
     INDEX NAME)



● H<sup>+</sup>

L34 ANSWER 6 OF 11 HCAPLUS COPYRIGHT 2002 ACS  
 AN 1993:580882 HCAPLUS  
 DN 119:180882  
 TI Comparison of the structures of pyramidal carbocations and their silicon  
     analogs.  
 AU Jemmis, Eluvathingal D.; Subramanian, Govindan; Prasad, Bharatam V.;  
     Tsuzuki, Seiji; Tanabe, Kazutoshi  
 CS Sch. Chem., Univ. Hyderabad, Hyderabad, 500 134, India  
 SO Angew. Chem. (1993), 105(6), 921-3 (See also Angew. Chem., Int. Ed. Engl.,  
     1993, 32(6), 865-7)  
 CODEN: ANCEAD; ISSN: 0044-8249  
 DT Journal  
 LA German  
 CC 29-6 (Organometallic and Organometalloidal Compounds)  
     Section cross-reference(s): 22  
 AB Theor. calcns. on nido-B5H9 and its isoelectronic pyramidal carbocation  
     C5H5<sup>+</sup> along with Si analog Si5H5<sup>+</sup> is presented. The geometry of C4H4X (X  
     = CH<sup>+</sup>, BH, SiH<sup>+</sup>, Si) and Si4H4X (X = BH, SiH<sup>+</sup>, Si) is calcd. by HF/6-31G\*.  
 ST pyramidal carbocation silicon analog MO; total energy pyramidal  
     carbocation silicon analog; mol structure pyramidal carbocation silicon  
     analog  
 IT Energy, total  
     Molecular structure  
         (of pyramidal carbocations and their silicon analogs)  
 IT Carbocations  
     RL: RCT (Reactant)  
         (pyramidal, and their silicon analogs, MO calcns. for)  
 IT Molecular orbital  
         (Hartree-Fock, of pyramidal carbocations and their silicon analogs)  
 IT 19624-22-7, Pentaborane(9) 58252-09-8 70388-05-5, 1-  
     Silatetracyclo[2.1.0.01,3.02,5]pentane 150152-92-4, 2,3,4,5-  
     Tetracarbapentaborane(5) 150350-80-4  
     RL: PRP (Properties)

(MO calcns. of)  
 IT 150152-93-5, 2,3,4,5-Tetrasilapentaborane(5) 150176-11-7,  
 Tetracyclo[2.1.0.01,3.02,5]pentasilane 150350-81-5  
 RL: RCT (Reactant)  
 (hydrogen-bridged form, MO calcns. of)  
 IT 150152-93-5, 2,3,4,5-Tetrasilapentaborane(5)  
 RL: RCT (Reactant)  
 (hydrogen-bridged form, MO calcns. of)  
 RN 150152-93-5 HCPLUS  
 CN 2,3,4,5-Tetrasilapentaborane(5) (9CI) (CA INDEX NAME)



L34 ANSWER 7 OF 11 HCPLUS COPYRIGHT 2002 ACS  
 AN 1991:122689 HCPLUS  
 DN 114:122689  
 TI .sigma.-Bridged-.pi. bonding in small-ring compounds  
 AU Liang, Congxin; Allen, Leland C.  
 CS Dep. Chem., Princeton Univ., Princeton, NJ, 08544, USA  
 SO J. Am. Chem. Soc. (1991), 113(6), 1878-84  
 CODEN: JACSAT; ISSN: 0002-7863  
 DT Journal  
 LA English  
 CC 29-14 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 22  
 AB .sigma.-Bridged-.pi. orbitals characterize the three-center bonds that often occur in electron-sufficient, small ring compds. made of atoms such as C, N, O, Si, P, and S. This bonding pattern proves efficient in explaining bond length changes and strain energies in three-membered rings and the unusual geometries of some four-membered rings. It is also shown that explanations based on this type of orbital are compatible with a no. of other theor. models in the literature and that use of the .sigma.-bridged-.pi. bonding concept helps extend and unify them.  
 ST small ring compd bond length; strain energy small ring compd; MO calcn  
 small ring compd; quantum chem small ring compd  
 IT Bond length  
 (of .sigma.-bridged .pi.-bonded small ring compds.)  
 IT Cyclic compounds  
 RL: RCT (Reactant)  
 (of .sigma.-bridged .pi.-bonded small ring compds.)  
 IT Quantum chemistry  
 (Hartree-Fock, of .sigma.-bridged .pi.-bonded small ring compds.)  
 IT Molecular orbital  
 (ab initio, of .sigma.-bridged-.pi. bonded small-ring compds.)  
 IT Potential energy and function  
 (strain, of .sigma.-bridged .pi.-bonded small ring compds.)  
 IT 287-19-4, 1,3,2,4-Dioxadiboretane 287-50-3, 1,3-Dioxetane 503-30-0,  
 Oxetane 18464-81-8, 1,3,2,4-Diazadiboretidine 77385-69-4,

1,3-Diboretane 130434-35-4, 2,4-Dioxa-1,3-diborabicyclo[1.1.0]butane  
 RL: RCT (Reactant)  
 (Hartree-Fock calcd. structures of)

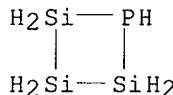
IT 75-19-4, Cyclopropane 75-21-8, Oxirane, properties 151-56-4,  
 Aziridine, properties 157-17-5, 1H-Azirine 157-18-6, Oxirene  
 157-22-2, 3H-Diazirine 157-26-6, Dioxirane 2781-85-3, Cyclopropene  
 16488-40-7, 1H-Borirene 39517-80-1, Borirane 60720-12-9, Diborirane  
 84837-52-5, Triborirane 85302-95-0, Azadiboriridine 130434-32-1,  
 Oxadiborirane 130434-33-2, 3H-Diazaboririne 130434-34-3, Dioxaborirane  
 RL: RCT (Reactant)  
 (ab initio MO calcn. of, bond length changes and strain energies in  
 relation to)

IT 287-69-4, Cyclotetrasilane 68492-56-8, Phosphatrisilacyclobutane  
 79793-09-2, Trisilacyclobutane 87729-91-7, Oxatrisilacyclobutane  
 87804-56-6, Thiatrisilacyclobutane 110205-56-6, Azatrisilacyclobutane  
 RL: PRP (Properties)  
 (calcd. silicon-silicon bond length in)

IT 68492-56-8, Phosphatrisilacyclobutane  
 RL: PRP (Properties)  
 (calcd. silicon-silicon bond length in)

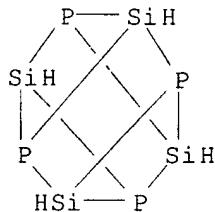
RN 68492-56-8 HCAPLUS

CN Phosphatrisilacyclobutane (9CI) (CA INDEX NAME)



L34 ANSWER 8 OF 11 HCAPLUS COPYRIGHT 2002 ACS  
 AN 1990:198528 HCAPLUS  
 DN 112:198528  
 TI Strong phosphorus-phosphorus interactions in tetraphosphacubanes. A  
 photoelectron spectroscopic investigation  
 AU Gleiter, Rolf; Pfeifer, Karl Heinz; Baudler, Marianne; Scholz, Guido;  
 Wettling, Thomas; Regitz, Manfred  
 CS Org.-Chem. Inst., Univ. Heidelberg, Heidelberg, D-6900, Fed. Rep. Ger.  
 SO Chem. Ber. (1990), 123(4), 757-60  
 CODEN: CHBEAM; ISSN: 0009-2940  
 DT Journal  
 LA German  
 CC 29-7 (Organometallic and Organometalloidal Compounds)  
 Section cross-reference(s): 22  
 GI For diagram(s), see printed CA Issue.  
 AB The comparison between the first peaks of the PE spectra of I and II  
 yields about the same ionization energy for the first peak (4t2), but a  
 large difference (ca. 0.8 eV) for the second peak (1t1). This difference  
 is due to a strong interaction of the n orbitals at P with the P-C .sigma.  
 bonds in I. This n/.sigma. interaction is much smaller in the case of II.  
 The energy difference between 24T2 and 23A1, corresponding to the  
 lone-pair combinations of the n orbitals at the P atoms, amts. to  
 .gtoreq.3.4 eV for I and is estd. at .gtoreq.1.6 eV for II. The net  
 charges for the P atoms in I are calcd. to be pos., those for the C atoms  
 neg. In the case of II neg. values result for P and pos. values for the  
 net charges at Si.  
 ST photoelectron emission phosphacubane; MO tetraphosphacubane;  
 silaphosphacubane MO; tetrasilatetraphosphacubane MO; phosphorus  
 phosphorus interaction phosphacubane

IT Molecular orbital  
 Photoelectric emission  
 (of tetraphosphacubanes)  
 IT 119328-17-5 121869-04-3 123775-93-9 123775-94-0  
 RL: PRP (Properties)  
 (MO calcns. of)  
 IT 118762-11-1 121097-72-1  
 RL: PROC (Process)  
 (photoelectron emission and MO calcns. of)  
 IT 119328-17-5  
 RL: PRP (Properties)  
 (MO calcns. of)  
 RN 119328-17-5 HCPLUS  
 CN 1,3,5,7-Tetrphospha-2,4,6,8-tetrasilapentacyclo[4.2.0.02,5.03,8.04,7]octa  
 ne (9CI) (CA INDEX NAME)



L34 ANSWER 9 OF 11 HCPLUS COPYRIGHT 2002 ACS  
 AN 1988:461596 HCPLUS  
 DN 109:61596  
 TI Model clusters and electronic characteristics of deep-level impurities in silicon  
 AU Russo, N.; Toscano, M.; Barone, V.; Minichino, C.  
 CS Dip. Chim., Univ. Calabria, Cosenza, Italy  
 SO Phys. Status Solidi B (1988), 145(2), K125-K130  
 CODEN: PSSBBD; ISSN: 0370-1972  
 DT Journal  
 LA English  
 CC 65-3 (General Physical Chemistry)  
 AB The X-Si<sub>4</sub>H<sub>12</sub> and X-Si<sub>20</sub>H<sub>28</sub> (X = P or N) cluster models were studied by the MNDO method. Energy levels of all the model clusters are reported. Both the highest occupied and lowest empty one-electron levels are localized. In the case of P impurity, the initial on-center arrangement corresponds to an abs. min. energy leading to 4-equiv. Si-P bond lengths of 0.235 nm.  
 ST model cluster deep level impurity silicon  
 IT Electron configuration  
 (of deep-level impurities in silicon)  
 IT Energy level  
 (of silicon clusters contg. nitrogen and phosphorus impurities)  
 IT Molecular orbital  
 (MNDO, of silicon clusters contg. nitrogen and phosphorus impurities)  
 IT Bond length  
 (phosphorus-silicon, in silicon cluster compds. contg. phosphorus impurity)  
 IT 13765-44-1D, Silyl, mol. assocn. with 13862-16-3D, mol. assocn. with 15947-57-6 115519-95-4 115519-96-5 115519-97-6 115519-98-7  
 RL: PRP (Properties)  
 (energy levels of)  
 IT 7440-21-3, Silicon, properties

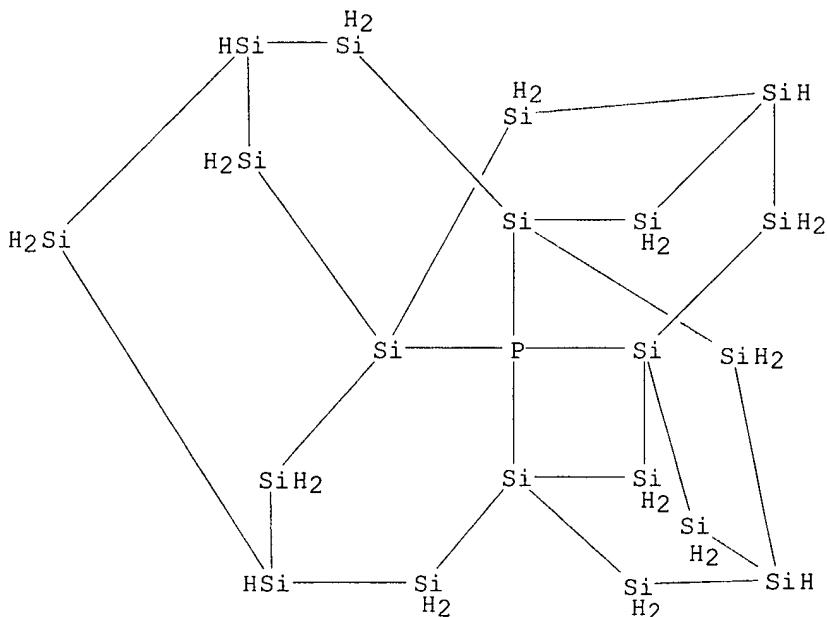
RL: PRP (Properties)  
 (model clusters and electronic characteristics of deep-level impurities  
 in)

IT 115519-98-7

RL: PRP (Properties)  
 (energy levels of)

RN 115519-98-7 HCAPLUS

CN 2.1lambda.5-Phospha-1,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21-  
 eicosasilaoctacyclo[7.7.1.11,11.13,7.13,15.15,13.02,7.02,13]heneicos-2-yl  
 (9CI) (CA INDEX NAME)



L34 ANSWER 10 OF 11 HCAPLUS COPYRIGHT 2002 ACS

AN 1987:598453 HCAPLUS

DN 107:198453

TI Hetero-substituted cyclopolsilanes. Unusual structures and a new model  
 of bonding in 1,3-disubstituted four-membered rings

AU Grev, Roger S.; Schaefer, Henry F., III

CS Lawrence Berkeley Lab., Univ. California, Berkeley, CA, 94720, USA

SO J. Am. Chem. Soc. (1987), 109(22), 6577-85

CODEN: JACSAT; ISSN: 0002-7863

DT Journal

LA English

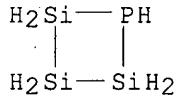
CC 29-6 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 22

AB The mol. structures and vibrational frequencies of monosubstituted  
 cyclopolsilanes  $(\text{SiH}_2)_n\text{X}$  ( $\text{X} = \text{CH}_2, \text{NH}, \text{O}, \text{PH}, \text{S}; n = 2, 3$ ) are detd. with  
 ab initio SCF quantum mech. techniques. The monosubstituted 4-membered  
 rings do not exhibit any remarkable structural features, while all the  
 monosubstituted three-membered rings have unusually short Si-Si bond  
 distances and nearly planar Si-Si-H<sub>2</sub> units, which can be explained via  
 Dewar's model of metal-olefin bonding. A simple extension of this model  
 to the case of 1,3-disubstituted four-membered rings readily explains the  
 unusual geometries found in many of these systems. This model is quite

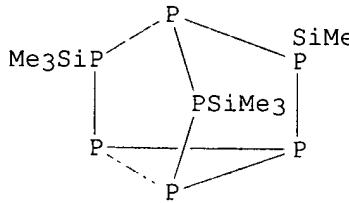
general and focuses on the ring orbitals themselves, unlike previous models which often invoked large lone pair-lone pair interactions to explain obsd. deviations from ideal square planar geometries. Thus, it is applicable to both 3- and 4-membered substituted and unsubstituted rings alike. The bonding in cyclodisiloxane is described as that of a dibridged  $\pi$ -complex, and the bond between the silicones, if it exists, is most likely that of an unsupported  $\pi$ -bond.

ST cyclopolsilane heterosubstituted structure MO; cyclotetrasilane disubstituted bonding model; conformation potential barrier phosphacyclotrisilane; pi bond unsupported cyclodisiloxane  
 IT Electron configuration  
     (of cyclodisiloxane, cyclodisilathiane, cyclotetrasilane, and trisilane)  
 IT Molecular vibration  
     (of cyclopolsilanes and hetero-substituted derivs.)  
 IT Molecular structure  
     (of cyclopolsilanes and hetero-substituted derivs., MO study of)  
 IT Pi bond  
     (unsupported, between silicones in cyclodisiloxane, MO calcns. in relation to)  
 IT Molecular orbital  
     (ab initio SCF, of cyclopolsilanes and hetero-substituted derivs.)  
 IT Potential barrier  
     (conformational, of phosphacyclotrisilane)  
 IT 287-67-2, Cyclodisilathiane 287-69-4, Cyclotetrasilane 7783-26-8,  
     Trisilane 34392-10-4, Cyclodisiloxane  
 RL: RCT (Reactant)  
     (Mulliken overlap population anal. of)  
 IT 157-32-4 18548-76-0 51130-21-3 **68492-56-8** 72926-93-3  
     79793-09-2 87729-91-7 87804-56-6 95912-91-7 110205-55-5  
     110205-56-6  
 RL: RCT (Reactant)  
     (mol. structure and vibrational frequencies of, MO calcns. of)  
 IT **68492-56-8**  
 RL: RCT (Reactant)  
     (mol. structure and vibrational frequencies of, MO calcns. of)  
 RN 68492-56-8 HCAPLUS  
 CN Phosphatrisilacyclobutane (9CI) (CA INDEX NAME)



L34 ANSWER 11 OF 11 HCAPLUS COPYRIGHT 2002 ACS  
 AN 1980:197738 HCAPLUS  
 DN 92:197738  
 TI Heptaphosphanortricycles: bonding model in P7H3 and photoelectron spectrum of tris(trimethylsilyl)heptaphosphanortricyclene (P7[Si(CH<sub>3</sub>)<sub>3</sub>]<sub>3</sub>)  
 AU Bock, H.; Solouki, B.; Fritz, G.; Hoelderich, W.  
 CS Inst. Anorg. Chem., Univ. Frankfurt, Frankfurt/Main, D-6000/50, Fed. Rep. Ger.  
 SO Z. Anorg. Allg. Chem. (1979), 458, 53-61  
 CODEN: ZAACAB; ISSN: 0044-2313  
 DT Journal  
 LA German  
 CC 22-8 (Physical Organic Chemistry)

GI



I

AB The He(I) photoelectron spectrum of I [ $P_7(SiMe_3)_3$ ] exhibits 6 band up to 12 eV. The assignment is based on a qual. bonding model for  $P_7H_3$  and is supported by MNDO calcns. for  $P_7H_3$  and  $P_7(SiH_3)_3$ . Considerable nonbonding P contributions are predicted for the lowest radical cation states. The charge distribution calcd. for the geometry-optimized ground state of  $P_7(SiH_3)_3$  corresponds to that for  $P_4S_3$ , which is isoelectronic with  $P_7H_3$ .

ST photoelectron spectrum tristrimethylsilylheptaphosphortracyclicene; MO bonding heptaphosphortracyclicene; electron configuration heptaphosphortracyclicene; silylheptaphosphortracyclicene photoelectron spectrum

IT Photoelectric emission  
(from tris(trimethylsilyl)heptaphosphortracyclicene)

IT Bond

IT Electron configuration  
(in heptaphosphortracyclicene)

IT Ionization potential and energy  
(of tris(trimethylsilyl)heptaphosphortracyclicene)

IT Molecular orbital  
(MNDO, of heptaphosphortracyclicene)

IT 51273-53-1 **73553-40-9**

IT RL: PRP (Properties)  
(MO of, bonding and)

IT 57990-97-3

IT RL: PRP (Properties)  
(photoelectron spectrum of, bonding and)

IT **73553-40-9**

IT RL: PRP (Properties)  
(MO of, bonding and)

RN 73553-40-9 HCAPLUS

CN Heptaphosphatricyclo[2.2.1.02,6]heptane, trisilyl- (9CI) (CA INDEX NAME)

